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EFFECTS ON PROCUREMENT
PRODUCTIVITY AT NAVAL HOSPITALS
UTILIZING THE AUTOMATED PROCUREMENT
SYSTEM(APS)

by

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December, 1994

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This research was conducted to study the effects on procurement productivity as a result of the implementation of an Automated Procurement System (APS) at four major teaching hospitals: the National Naval Medical Center, Bethesda, MD, the Naval Medical Center, San Diego, CA, the Naval Medical Center, Portsmouth, VA, and the Naval Medical Center, Oakland, CA. The system installed at these activities was a Bureau of Medicine and Surgery (BUMED) modified version of SACONS-FEDERAL. Previous conversations with Procurement Department Heads at these activities indicated that the system had not increased purchasing agent productivity. My goal of this research, entailed analyzing productivity data from each hospital, before and after system installation, and determining if procurement productivity had changed. Although procurement productivity variables did not show considerable improvement, the integration of the procurement, receiving, and receipt control functions, as well as increased management reporting capabilities and other system benefits, constitutes this as a sound system, worthy of consideration by any contracting agency.

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EFFECTS ON PROCUREMENT PRODUCTIVITY
AT NAVAL HOSPITALS UTILIZING
THE AUTOMATED PROCUREMENT SYSTEM(APS)

by

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ABSTRACT

This research was conducted to study the effects on procurement productivity as a result of the implementation of an Automated Procurement System (APS) at four major teaching hospitals: the National Naval Medical Center, Bethesda, MD, the Naval Medical Center, San Diego, CA, the Naval Medical Center, Portsmouth, VA, and the Naval Medical Center, Oakland, CA. The system installed at these activities was a Bureau of Medicine and Surgery (BUMED) modified version of SACONS-FEDERAL. Previous conversations with Procurement Department Heads at these activities indicated that the system had not increased purchasing agent productivity. My goal of this research, entailed analyzing productivity data from each hospital, before and after system installation, and determining if procurement productivity had changed. Although procurement productivity variables did not show considerable improvement, the integration of the procurement, receiving and receipt control functions, as well as increased management reporting capabilities and other system benefits, constitutes APS as a sound system, worthy of consideration by any contracting agency.

TABLE OF CONTENTS

I.   INTRODUCTION

The intent of this study is to analyze and determine whether the installation of an Automated Procurement System (APS) at four major Naval hospitals actually increased buyer productivity in small purchase operations. Conversations with Procurement Department Heads at the four Naval hospitals indicate that APS has not increased buyer productivity. I intend to put that belief to the test by analyzing various productivity data obtained from each hospital.

A.   WHAT IS A SMALL PURCHASE ?

A small purchase is defined as the acquisition of any supply, non-personal service, or construction of which the aggregate amount does not exceed $25,000. Annually, approximately 95% of all contracting actions awarded by the Department of Defense are awarded under small purchase procedures. (NAIT, UNDATED)

Several methods are employed for awarding small purchases, including: Blanket Purchase Agreements (BPA's), Purchase Orders, Imprest Fund Orders, Credit Cards, Delivery Orders placed against Federal Supply Schedules and a new initiative, utilized by Bureau of Medicine and Surgery (BUMED) activities, known as Prime Vendor.

The sources for this study include the small purchase operations at the National Naval Medical Center, Bethesda MD, the Naval Medical Center, Portsmouth VA, the Naval Medical Center, San Diego CA, and the Naval Medical Center, Oakland, CA.

B.   WHAT IS SACONS ?

The Standard Automated Contracting System (SACONS) is an automated contracting system used to automate the buying process for purchasing agents and provide for increased visibility of requisition status and management support with

1

enhanced reporting capabilities. The SACONS system was developed by CACI, Inc. There are two standard versions of the system. SACONS-FEDERAL, which is the basic system installed at the Naval hospitals, and the Standard Army Automated Contracting System (SAACONS) which was developed and has been implemented specifically at various Army activities.

Specific advantages of SACONS-FEDERAL, as promoted by CACI in company literature, include:

- Improved productivity

- Simplification of the work process

- Enhanced status reports

- Various standard reports and ad-hoc report capabilities

- Reduced Procurement Administrative Lead Time (PALT)

- On-line Federal Acquisition Regulations (FAR)

- Automated document preparation

- Electronic buyer worksheets

- Automatic vendor rotation capability

- Consolidation of purchase requests

- Hot-line phone support for trouble shooting problems

- Complete user documentation

- Local clause matrix management

- Automatic generation of the DD1057 Monthly Contracting Summary of Actions $25,000 or less report

- System security level settings

The SACONS-FEDERAL version installed at the BUMED activities included the preceding capabilities, as well as various technical enhancements, including modified buyer worksheets and additional invoicing and receiving modules.

2

These additional modules were requested by BUMED for use by hospital receiving docks and receipt control divisions.

The systems technical requirements required it to be a multi-user system running on a standard Medical Open Architecture (MED-OA) Local Area Network. The System server is a Sequent Symmetry 2000/250 computer with two CPU's, 64 MB memory, 662 MB disk storage, 525 MB cartridge tape, modem and cable, system console which runs DYNIX/ptx, Sequent's enhanced version of UNIX. The server is networked to individual 386 workstations with 4MB memory, 80MB IDE HD, 3.5" 1.44MB floppy drive, 5.25 Flexible Disk drive, 1.2MB 360KB internal HD, Super VGA monitor, (1042x768), Super VGS card(512K), and 101 key keyboard. Printer requirements are Hewlett Packard Laser Jet II printers. (NMIMC, 1993)

II. BACKGROUND

SACONS-FEDERAL is in use at many Department of Defense activities. The first Navy installation to utilize the system was the Naval Postgraduate School in Monterey, CA, which came on-line in 1988. The initial version of SACONS-FEDERAL installed at the Naval Hospitals was version 3.1, which included the receiving and receipt control i.e., invoicing, modules and various additional enhancements not included in the previous version. The National Naval Medical Center (NNMC) in Bethesda, Maryland was the BUMED test site of the system for Naval medical activities. The National Naval Medical Center was also the first, of any SACONS activity, to have version 3.1 installed.

A. HOSPITAL SMALL PURCHASE OPERATIONS

Small purchase operations at Naval hospitals have traditionally been very stressful environments for employees and management. Trying to keep pace in these very dynamic facilities, where the need for medical supplies is critical to the treatment of patients, is a continual challenge. Often times, medical supplies required are in life threatening situations and must be procured immediately. This unique environment combined with the antiquation of the procurement process has led to serious breakdowns in timely customer support at some activities. Failed Procurement Management Reviews (PMR's), stripping activities of their procurement authority, and increased backlogs of customer requisitions, have historically hindered the hospitals' mission to provide outstanding quality healthcare.

Many small purchase operations at Naval hospitals have existed without automated programs to facilitate the buying process; instead, continuing to use manual methods and the typewriter for preparing purchase orders. However some

activities have implemented locally generated computer programs to semi-automate their small purchase operations. The four largest Naval hospitals analyzed in this thesis each utilized their own unique system, either generated by local Management Information Departments (MID's) or an employee who liked the challenge of developing a system to make the job easier.

The combined pressures of continual requirements to support customers with critical supplies immediately, the increased threat of personnel reductions, the added complexity of procurement regulations and reporting requirements, and the lack of a standardized, completely automated procurement system, all verified the need to employ the latest in information technology. The challenge was clear, to either develop or procure a software acquisition program. Rather than develop a new system from scratch, the decision was made to procure an existing off-the-shelf commercial software package.

B. INITIATION OF APS

On March 11, 1991 an Abbreviated System Decision Paper (ASDP) was drafted by Lieutenant Greg Kuhn, MSC, USN to procure an automated procurement system. The mission element need statement read as follows:

> Naval Medical Treatment Facilities with authority to conduct government contracting have a critical need to automate. The purchasing departments play an intricate role to the overall mission of Navy Medicine. A tremendous amount of equipment and supplies are procured for use by physicians and patients. Virtually all small purchase acquisitions are performed manually at the National Naval Medical Center (NNMC), Bethesda, MD. The Supply Management Directorate must implement a comprehensive automated system to support the procurement and material management departments. (Kuhn, 1991)

Although the ASDP was drafted initially for the National Naval Medical Center (NNMC), BUMED and the Naval Medical Information Management Center (NMIMC) realized the need for an automated procurement system at all four of the major teaching hospitals. In May 1992, contract N00600-92-C-1272 was awarded to Edge Systems Inc. of Arlington, Virginia for $1.2 million dollars, to include installation of the SACONS system at all four hospitals. The hardware portion of the contract was subcontracted to Sequent Computer Systems Inc. while the software portion was subcontracted out to CACI Inc. of Arlington, Virginia. System installation and implementation were scheduled for the National Naval Medical Center Bethesda, MD in June 1992.

III. SYSTEM IMPLEMENTATION

Implementation of the system at the National Naval Medical Center, selected as the Beta-test site, began in early June 1992. The National Naval Medical Center was the first facility installed with SACONS-FEDERAL Version 3.1; no other DOD facility had yet tested this new version.

Several problems hampered the initial installation of the system including incorrect electrical power specifications and various software and hardware problems. (Lakatos, 1992)

Vendor files, address files, local clauses and clause matrices, and Blanket Purchase Agreements (BPA's) were entered into the system database by temporary personnel employed by CACI. System training for procurement personnel began on July 20, 1992 and continued through the second week of August. While the training was being conducted the computer workstations were being prepared for the system to go on-line when the training was completed. The first requisitions were entered into the system on August 11, 1992.

Several software and hardware problems continued to hamper the implementation including, lost purchase orders and lengthy system down time. The effect of these problems on the operations of the procurement department were greatly compounded by the fact that the department was already procuring fiscal year-end requisitions and was preparing for an upcoming Procurement Management Review (PMR) inspection due in November.

Several meetings were conducted over the next few months with CACI and EDGE Systems representatives, as well as, representatives from the NNMC's Management Information Department (MID), Acquisition Management Department, and Project Managers from the Naval Medical Information Management Center (NMIMC) and the Contracting Officer from the Naval Regional Contracting Center (NRCC), Washington Navy Yard.

These meetings were conducted in order to correct system deficiencies and clarify contract requirements necessary to deploy an acceptable system.

As problems with the system were being identified by the NNMC, the contractor was preparing for the installation of the system at the other three Naval Hospitals. Naval Medical Center, San Diego was the second facility to come on-line with the system in January 1993. Naval Medical Center, San Diego experienced many of the same hardware and software problems as NNMC encountered. The third hospital to go on-line was the Naval Medical Center, Portsmouth, which started using the system in March 1993. The Naval Medical Center, Oakland began awarding requisitions on the system in April 1993. Again, similar problems were experienced at these two activities, in terms of software and hardware difficulties.

As with many new automated systems, problems and resistance to change are expected facts of life. Faerstein (1986) summarized this problem by the following:

> Such terms as "computerphobia," "cyberphobia," technophobia," and "technostress," characterize the resistance to change in the work place and emphasize how critical it is to understand and plan for the human perspective when installing new technology.

The magnitude of software and hardware problems encountered with the installation of SACONS was higher than anticipated. These problems compounded with the anxiety to change and the fear of automation, led to a very frustrating time for everyone involved.

Now, in excess of two years since the system was installed at the National Naval Medical Center, people have become more familiar with the system. As the bugs and inadequacies of the system were corrected, frustration levels decreased considerably. The learning curve now is practically non-existent and procurement agents and management personnel

generally favor the system for its ability to generate key management reports and the ability to provide life-cycle visibility and immediate requisition status. However, there is still some frustration amongst the purchasing agents when accessing the many different screens required to place a purchase order.

My intent in this thesis is not to elaborate and list each problem encountered with the installation of the Automated Procurement System. However, I do think it is important for the reader to appreciate the transition to this brand new version 3.1 of SACONS-FEDERAL was a huge challenge and a source of great frustration to the management and procurement personnel at each of these Naval hospitals.

IV. METHODOLOGY

A. APPROACH

The approach I took to evaluate the Automated Procurement System was to perform an analysis of various data accumulated from the four Naval Hospitals in a before and after scenario.

Key indicators I chose to focus on were:

- Procurement Administrative Lead time (PALT).

- The number of requisitions received.

- The number of requisitions awarded.

- The number of Backlog or Work-in-progress (WIP) requisitions.

- Productivity ratio determining the number of awards based on productive buyer hours or buys per hour of buyer productive time.

B. PROCUREMENT ADMINISTRATIVE LEAD TIME (PALT)

A key measurement in any procurement operation is PALT, the time it takes to process a customer's requisition from when he/she delivers it to the procurement department through to the time that the requisition is awarded and signed by a contracting officer. Many small purchase operations base their productivity measures on their PALT figures.

C. REQUISITIONS RECEIVED

The number of requisitions received by the procurement department is a good indicator of the activity level of any procurement department. By tracking the number of requisitions on a monthly basis, over an annual period, the busiest times of the fiscal year are easily identified for management to make necessary strategic moves to process increased or decreased workload. The number of requisitions received does not necessarily measure the length of time required to award a purchase order, but it does have a significant impact on PALT. Many requisitions received at one

time, i.e., during the end of the fiscal-year, will obviously increase PALT.

D. REQUISITIONS AWARDED

The number of requisitions awarded by the procurement activity, as with the number of requisitions received, is also a good indicator of the workload that each department generates as output. This indicator can also be measured on a monthly basis to aid management in strategic decision making.

E. BACKLOG, WORK IN PROGRESS

Backlog or work in progress (WIP), includes the number of requisitions that are either currently being processed by a procurement agent and have yet to be awarded or are in the system waiting to be processed. Backlog is a key indicator for management personnel to determine the department's ability to meet workflow requirements over the course of a fiscal year.

F. PRODUCTIVITY RATIO

Is simply the ratio of the number of awards divided by the number of productive buyer hours, equalling the number of awards per hour generated by each procurement agent in a department. This measure of effectiveness helps management to determine the efficiency and timeframe required to award requisitions and utilizes the industrial engineering approach in measuring productivity, in terms of input-output ratios.

G. LIMITATIONS

The data utilized for this study originates from local command productivity reports, Measures of Effectiveness (MOE) reports, and DD1057 Monthly Contracting Summary of Actions $25,000 or less reports, that were gathered from site visits to all four activities. Some data was not available from all sites so information may be somewhat limited at some

activities.   Hospitals also gathered their information and reported that information in various, non-standardized formats.   As a result, I will analyze each activity on an individual basis and not make direct comparisons between productivity findings at each hospital.

My analysis will reflect the unique aspects of each hospital's reporting requirements and their interpretations of any productivity differences experienced with the implementation of the Automated Procurement System.

H.   TIMEFRAMES

I tried to gather data from each activity at a maximum of one year prior to system implementation, up to July 1994 data. Some hospitals did not have data for a full year prior to implementation, in which case, I used data as far back as available.   Some hospitals provided data through September 1994.

Each Naval hospital has been utilizing the system for a minimum of a year and a half at the time of this study. As a result, the most recent data reflects greater user familiarity with the system, as the learning curve diminished, and should represent a more accurate picture of productivity gains or decreases as a result of APS.

I.   ADDITIONAL INFORMATION

As part of my study, I also conducted interviews with the Program Managers for the system, as well as, Department Heads, Procurement Agents and Systems Administrators at all four sites.   I will include general opinions they articulated in regards to APS and any recognized benefits achieved by the system, as well as, any negative feedback they have experienced over the past two years.

I also recognized the various different organizational compositions of the small purchase operation at each hospital, including, the requisition flow from the time a customer

15

submits a requisition to the time it is awarded by the purchasing agent. Requisition flow was analyzed before and after system implementation.

J. PREVIOUS STUDIES

Previous productivity studies utilized the industrial engineering definition of productivity: the ratio of output divided by input, whereby as a measure of output increases, or a measure of input decreases, or a combination of both occurs simultaneously, then the productivity ratio increases (Barclift and Linson, 1988).

Barclift and Linson in their SAACONS study of 1988 at FT. Saxon, recognized great improvements in procurement productivity after the installation of the system. Staffing reduced from an average of 66.69 people to 62.70 or a 5.98% decrease in manpower requirements and PALT was reduced from 31.52 days to 20.97 days for a 33.47% decrease (Barclift and Linson, 1988). Additional benefits of this study recognized the elimination of purchase order typists, since each buyer generated their own, and increased status visibility of requisitions. Supervisors were better able to monitor buyer workload and progress.

Additional follow on studies, utilizing the methodology employed by Barclift and Linson, were conducted at other sites including a study of NAS Sloat, conducted by Murphy and Davis in 1989. Murphy and Davis in 1989 discovered the benefits at NAS Sloat were not as positive as at Ft. Saxon. However, many external factors such as high personnel turnover, a hiring freeze, a failed Procurement Management Review (PMR) and NAS Sloats' designation as the Beta (test) site for SACONS-FEDERAL, definitely impacted on the their findings. Their study showed an increase in procurement staff from 9.8 to 12.3 people, an increase of 25.5%. PALT averaged 17.4 days prior

to system implementation and 15.1 days after system implementation, a decrease of 13.2% (Murphy and Davis, 1989).

Due to the immense magnitude of my study, analyzing four different activities, vice one, I will not concentrate on some of the variables that were included in the previous studies. Instead, my analysis will be based primarily on available productivity data from each hospital, based on local productivity reports, local MOE's and data from DD1057 Summary reports. Physical procurement files were not available to me when I gathered my data, hence, I did not conduct a random sampling research method as developed by Barclift and Linson and utilized by Murphy and Davis. I do believe the data available to me will provide a solid basis for my study and will provide an accurate depiction of any productivity effects the Automated Procurement System has had on the small purchase operations at each of the Naval hospitals.

K. PRODUCTIVITY PARADOX

With the proliferation of inexpensive, more powerful, personal computers and increased user-friendly software capabilities over the last decade, information technology at all levels of organizations has and continues to spread rapidly. Numerous articles and studies have been published regarding information technology and the fallacy that increased automation always leads to increased productivity. An excellent summation of this productivity paradox is an article by Reichard (1992) of the same name. Reichard discusses some of those different articles and studies in which the major premise is: increased automation does not necessarily guarantee increased productivity. In fact, American industry tends to invest more money in additional information systems rather then trying to correct the failings of initial systems by reevaluating the actual job functions and procedures themselves. (Reichard, 1992)

17

Managers must be cautious when acquiring new information systems. They must ensure information systems are procured and implemented based on how the system will help them to perform their mission, vice restructuring the organization to conform to a system, and losing mission vision, or procuring more expensive systems with upgraded capabilities than are actually required. The benefits of increased productivity must be carefully considered when procuring a new system and weighed against the capital outlay for that system.

L. MANAGEMENT TRENDS

In today's business battlefield of increased innovation in information technology and the need to maintain a strategic competitive advantage over one's rivals, Senn (1990) lists eleven trends in management that managers must be aware of.

- Blurring of industry boundaries

- Deregulation of industries

- Faster pace of business

- Increasing foreign competition

- Global business community

- An information society

- Increasing complexity of management

- Interdependence of organization units

- Improvement of productivity

- Availability of computers for end-users

- Recognition of information as a resource

These trends must be carefully heeded and though some of these trends do not directly apply to operations in a government procurement environment, a majority of them must be

18

considered when implementing a system such as SACONS into an office environment.

V. NATIONAL NAVAL MEDICAL CENTER

A. INTRODUCTION

The National Naval Medical Center (NNMC), commonly referred to as the President's Hospital, is a 350-bed medical facility located in Bethesda, Maryland. The National Naval Medical Center is one of three major military hospitals in the greater Washington, D.C. metropolitan area, responsible for providing comprehensive inpatient and outpatient healthcare services to eligible personnel. NNMC is also responsible for Graduate Medical Education (GME) and provides contingency support to the USNS Comfort, homeported in Baltimore, Maryland.

The Acquisition Management Department, one of five departments under the Directorate for Logistics, is responsible for supporting the acquisition needs, not only for the hospital, but several local medical and dental clinics in the Washington, D.C. area and the following tenant commands:

- Naval Dental Center (NDC)

- Naval Health Sciences Education and Training Command (HSETC)

- Naval School of Health Sciences (NSHS)

- Naval Medical Research Institute (NMRI)

- Naval Medical Information Management Center (NMIMC)

The NNMC has been delegated contracting authority up to $25,000, the current small purchase threshold for competitive awards, and up to the Maximum Order Limit (MOL) on the items ordered under the Federal Supply Schedule (FSS).

NNMC utilizes the traditional ordering methods including: Purchase Orders, Delivery Orders, Imprest Fund orders, calls against Blanket Purchase Agreements and orders placed via the Prime Vendor program.

NNMC is also bound by the same acquisition regulations adhered to by other Naval contracting activities including: the Federal Acquisition Regulations (FAR), Defense Federal Acquisition Regulation Supplement (DFARS), and the NAVSUP 4200.85A, Shore and Fleet Small Purchase and Other Simplified Purchase Procedures regulation.

NNMC has had a history of procurement problems, including an Unsatisfactory rating from the Procurement Management Review (PMR) team in 1989, leading to suspension of command procurement authority. Procurement authority was reinstated in March 1990, however, average Procurement Administrative Lead Time (PALT) was still 24 days for all requisitions, which included priority three, six and thirteen combined. Requisition backlog was approximately 1500 requisitions (Kuhn, 1990). Although many of the documentation findings from the PMR had been corrected, the operational organization required streamlining for more efficient and effective workflow of customers requisitions. Major organizational changes were accomplished in 1990 to address the productivity problems encountered at NNMC. The data reflected in this study will include information starting from late 1991 in which productivity had shown great improvements, as result of those management initiatives.

B. ORGANIZATIONAL STRUCTURE

Presently, the department is restructuring its operations to include receipt control clerks operating in teams with procurement agents under the same supervisor. However, during the period of this study the Receipt Control Division was not a division of the Acquisition Management Department.

The Acquisition Management Department consisted of one military Department Head and a civilian GS-12, 1102 series, Contract Specialist, Assistant Department Head, supervising

three divisions: the Customer Service Division, the Small Purchase Division and the Contracts Division.

The Customer Service Division was responsible for the technical review of requisitions submitted by customers, as well as, providing status reports to customers. Upon implementation of APS, Customer Service, additionally, became the initial entry point for loading requisitions into the system. The Customer Service Division is staffed by four enlisted military personnel, ranging from a Senior Chief Storekeeper to a Storekeeper Second Class, on a permanent basis, but augmented with temporary military personnel on an occasional basis.

The Contracts Division coordinates the acquisition of annual contracts including, Indefinite Delivery Type Contracts (IDTC), Blanket Purchase Agreements (BPA), maintenance contracts, subscriptions, etc. This division also liaisons and forwards requisitions to the Navy Regional Contracting Center (NRCC) for contracts exceeding local command procurement authority. The Contracting Division is staffed by a GS-11, 1102 series, Contract Specialist as division head and another GS-11, 1102 series, Contract Specialist as the NRCC liaison. Additionally, one GS-1106 series, Procurement Clerk and three GS-1105 series, Purchasing Agents are assigned to the Contracts Division.

The Small Purchase Division is the third and final division within the Acquisition Management Department and is also the focal point of my data for small purchase operations at NNMC. The Small Purchase Division processes the day-to-day requisitions necessary to support the hospital and tenant commands with critical medical, dental and administrative consumable supplies and equipment.

The Small Purchase Division is staffed by one GS-11, 1105 series, Supervisory Purchasing Agent who supervises three GS-09, 1105 series, Team Supervisors. The three teams are

divided by commodities and customers and consist of the Ancillary, the Medical and Surgical, and the Administrative teams. Each Team Supervisor is responsible for managing four to six GS-1105 series, Purchasing Agents and one GS-1106 series, Procurement Clerk within their team. The team supervisor manages the workload assigned to each purchasing agent and monitors their performance. Previous to APS implementation, the division employed 19 purchasing agents actually producing orders. This number does not include supervisory personnel. Since the implementation of APS this number has been reduced to 16 purchasing agents. This is an important factor to consider when analyzing productivity gains or losses as a result of APS.

C. DOCUMENT FLOW PRIOR TO APS

Requisitions, prior to APS implementation, were submitted to the Customer Service Division. Requisitions were screened to ensure the items were not available through the Navy standard stock system. After the requisitions were screened, they were separated and physically distributed to the respective Team Supervisors. Team supervisors would distribute the requisitions to procurement agents. The procurement agents would then place their orders and generate the paperwork for that order, utilizing a locally developed database program. This local program also provided the capability to maintain a status listing and PALT report for all orders. Each team possessed a few computers located on the desks of some procurement agents, but only one computer/printer workstation to print out award documents. This created a situation where agents would be waiting in line to access the printer. Upon completion of the order, the order was forwarded for signature to the team supervisor, if signature authority was not granted to the buyer. The order was then forwarded to the procurement clerk for distribution

to the Fiscal department, Receiving, Receipt Control, and the customer.

D.   DOCUMENT FLOW AFTER APS

The entry point for customers requisitions remains the Customer Service Division, however, Customer Service now enters the requisition information from the NAVCOMP 2276, Request for Contractual Procurement, into APS, in addition to providing technical screening. Once Customer Service enters the information into APS, they electronically assign the requisition to the appropriate team supervisor, who now can access the information on their computer terminal, before physical receipt of the document. Physical delivery of the requisitions to the team supervisors is still being accomplished, two to three times a day, as before. The team supervisor assigns each requisition to a purchasing agent, via APS, as well as providing them with the hardcopy requisition. With APS implementation, each purchasing agent maintains their own computer workstation at their desk. Previously only some agents maintained a computer terminal at their desk. All awarding functions, required to process an order, are conducted by the buyer on their own workstation and contract replication is printed on a laser printer located in each team area. If the procurement agent does not have appropriate signature authority, the requisition is returned to the team supervisor for review and signature. The contract award is complete and award information is electronically transferred to Receipt Control. Copies of the award are no longer required to be forwarded to the Receiving and Receipt Control Divisions, because each area now possesses the capability to print out their own copy of the award. Distribution copies are still being forwarded to the Fiscal department and the customers.

E. DATA ANALYSIS

Data available for NNMC encompassed information for the pre-APS period from October 1991 to August 1992 and the post-APS period from September 1992 to July 1994. This data was obtained from various locally generated reports and Measures of Effectiveness (MOE) developed by NNMC management.

1. Requisitions Received

The timeframe for data analysis of requisitions received encompassed pre-APS data from October 1991 to August 1992 and post-APS data from September 1992 to July 1994.

The source of this data is local command data reports for monthly MOE's. These reports are prepared on a monthly basis and provided to the Director for Logistics and the Commanding Officer for review.

Appendix A, shows the monthly number of requisitions received by the department, both prior to and after APS implementation. Analysis of the data indicated that the average number of requisitions received prior to APS was 1234. The average number of requisitions received after APS implementation was 1117, a reduction of 117 requisitions or 10 percent. Trend analysis conducted further indicates a decreasing number of requisitions being received over this period.

A probable reason for the reduction in requisitions may be the implementation of the Prime Vendor program which was initiated on-line in May 1992. NNMC was the test site for this new ordering initiative. The Prime Vendor program is an Electronic Data Interchange (EDI) initiative encompassing procurement of pharmaceuticals and medical and surgical consumables through a primary vendor, who delivers the ordered material the following day. Requisitions for items available through the prime vendor were no longer forwarded to the Acquisition Management Department for action. This data would seem to indicate that if workload was reduced, PALT and

backlog would be expected to reduce as well. This was not the case.

2. Documents Awarded

The number of documents awarded was analyzed based on the same time frame as requisitions received. Award data was also extracted from the same monthly MOE reports.

Appendix B, shows the number of documents awarded by the department during this time frame. This number will usually be less than the number of requisitions received, as a result of consolidation of multiple requisitions into one award document or cancellations. Awarded documents at NNMC include: Imprest Fund orders, Delivery Orders, Purchase Orders and calls placed against existing Blanket Purchase Agreements (BPA's). The average number of awards prior to APS implementation was 1188. Average number of awards after APS was 1110, a decrease of 78 awards or seven percent. This decreasing trend in awards was expected, as the number of awards usually follows the same trend as the number of requisitions received. Again, the Prime Vendor program appeared to have an impact on this variable. Additionally, SACONS-FEDERAL software includes the capability which allows the procurement agent to easily consolidate multiple requisitions into a single award, reducing the number of individual awards.

3. Backlog, Work in Progress

Backlog data was analyzed over the same time period and extracted from the same MOE reports.

Appendix C, indicates that while requisitions received and documents awarded decreased, backlog increased. One would surmise that backlog would decrease as a result of the reduced workload. Prior to APS the average number of requisitions backlogged was 232. Post-APS data indicated the average number of backlogged requisitions was 288, an increase of 56 requisitions or 20 percent.

27

The contradiction in this variable might be explained by the reduction of three procurement agents in the Small Purchase division after APS was implemented.

4. PALT

Data obtained for PALT analysis was conducted over the same time period as the other variables and from the same MOE indicators. PALT calculated, in this study, is the monthly average of the combined priority three, six, and thirteen requisitions.

Average PALT prior to APS was 7.09 days for all priority group requisitions. Average PALT after APS was 9.26 days, an increase of 2.17 days or 23 percent. Appendix D, shows the increasing trend in PALT over the entire analysis period. However, further analysis conducted in Appendix E, reflects a steep downward trend in PALT prior to APS implementation, while Appendix F, depicts an increasing trend in PALT after APS implementation.

Data would seem to indicate that APS had a negative impact on PALT time. However, a combination of external factors may have impacted on this increased PALT. First, three purchasing agent positions were eliminated as a result of APS implementation. Secondly, an unusually large amount of requisitions were received in March 1993 impacting on PALT through the summer months. Finally, personnel at NNMC indicated that the Prime Vendor program may have impacted on PALT, as well. Requisitions which were generally simple and quick to process into awards were being ordered through the prime vendor, leaving more lengthy complicated buys to be processed by the department.

5. Productivity Ratio

The Productivity Ratio or Awards per Hour variable measures the number of awards per procurement agent, divided by the number of productive work hours. This data was evaluated over the same period as the other factors. The data

28

for this information was obtained from locally generated internal workload and management reports comprised by the Small Purchase Division Head. These reports were prepared bi-weekly for the Acquisition Management Department Head and the Director for Logistics.

The productivity ratio prior to APS was .53 awards per hour. The ratio after APS was .56 awards per hour, an increase of .03 or approximately five percent. Appendix G, details the increasing trend in the productivity ratio.

F. DATA SUMMARY

Although PALT and backlog increased while the number of requisitions received and awarded decreased, the increase was not substantial. In fact, productivity seemed to improve a small degree, based on the productivity ratio data. The loss of three purchasing agents to the department definitely had an effect on PALT and backlog, however, the productivity ratio indicated an increase in buyer efficiency.

Interviews with acquisition personnel indicate since APS implementation over two years ago, procurement agents and management personnel have become more accustomed to the system and generally give it positive reviews for overall performance. Although, at NNMC, the Acquisition Management Department did not realize a great increase in actual buyer productivity, the greatest gains of the system have been realized in the Receiving Division. The warehouse experienced a considerable decrease in frustrated freight which can be directly attributable to APS. Previously, receiving personnel wasted productive time trying to locate award documents, forwarded to them by the Acquisition Management Department. Often times this paper work was misfiled, not distributed or sometimes lost. APS allowed receiving personnel to utilize the system to print out their own copies of the award

documents, reducing frustrated freight waiting for paperwork. This also provided for quicker delivery to the customer.

VI. NAVAL MEDICAL CENTER, PORTSMOUTH VA

A. INTRODUCTION

The Naval Medical Center (NMC), Portsmouth VA is the oldest and second largest Naval hospital in the United States. The cornerstone for the original facility was laid in 1827 and the first patients were admitted in 1830. Currently the 446-bed hospital is undergoing major construction with the addition of a new acute care building, slated for completion in 1997. (Flagship, 1994)

NMC, Portsmouth is one of three military medical treatment facilities involved in the Tricare program, the military's first multi-service managed healthcare program, for managed health care in the Tidewater area. McDonald Army Community Hospital at Fort Eustis and the First Medical Group Hospital at Langley Air Force Base are the other two participants. These three facilities provide and coordinate health care for over 420,000 military medical beneficiaries. (Flagship, 1994)

The Contracting Branch of the Requirements Division, one of six divisions reporting to the Materiels Management Department Head, is responsible for the day-to-day processing of procurement requisitions for the hospital, as well as, providing procurement support for the following activities:

- Naval Station Norfolk, Sewell's Point VA

- Naval Amphibious Base, Little Creek, VA

- Norfolk Naval Shipyard, Portsmouth VA

- Naval Air Station, Oceana VA

- Fleet Combat Training Center, Dam Neck VA

- Naval Weapons Station, Yorktown VA

- Naval Security Group Activity, Chesapeake, VA

31

- Lafayette River Annex

- Naval Dental Center

- Naval School of Health Sciences

The NMC, Portsmouth has been delegated contracting authority up to $25,000 for open purchase orders and up to the MOL on items ordered under Federal Supply Schedules. The NMC, Portsmouth also utilizes the same procurement methods as the NNMC and is bound by the same acquisition regulations as well. NMC, Portsmouth had just completed a successful PMR in June 1994 with no significant findings.

B. ORGANIZATIONAL STRUCTURE

Both prior to, and since the implementation of the APS, the organization of the Contracting Branch within the Requirements Division has remained identical. Other Branchs located within the Requirements Division include the Technical Review Branch and the Control Branch.

The Contracting Branch is headed up by a civilian GS-12, 1102, series Contracting Specialist. The Contracting Branch is divided into two Purchasing Sections, each supervised by a civilian GS-11, 1105 series. There are eight purchasing agents in each section. Three Office Automation (OA) clerks provide support to the two sections. Annual contracts, such as maintenance contracts, subscriptions and IDTC's are performed within these two sections as well. There were no reductions in procurement agent billets during this study period.

The Technical Review Branch is staffed by one civilian and one military person and is responsible for performing the screening process of customer requisitions to ensure the requested materiels are not available through the standard stock system.

The Control Branch processes all requisitions for material supplies available through the standard stock system. The Control Branch, however, does not play a role in the actual award process of open market acquisitions.

C. DOCUMENT FLOW PRIOR TO APS

Requisition flow prior to APS implementation was as follows: Requisitions were submitted by the customer to the Technical Review Branch on the DD1149 Request for Procurement form. The Technical Review Branch would screen the requisitions and forward them to a clerk who entered the requisition into a locally developed Requisition Acquisition Tracking System (RATS) and forwarded the hardcopy requisition to one of the supervisors, who then assigned the requisition to a procurement agent. There was much duplication in the process flow between the supervisors and the procurement agents. Upon completion of the award, the requisition was forwarded to a typing pool, consisting of four typists. The typists manually typed up the award documents and forwarded the document for signature to either the supervisor or procurement agent, depending on who had appropriate signature authority. Award information was typed into the RATS to update requisition tracking information. Copies of the award documents were made and forwarded to the Receiving Section of the Materiels Division, the Control Branch and the Fiscal Department. Automation of the procurement process was primarily non-existent.

D. DOCUMENT FLOW AFTER APS

The entry point for customers' requisitions is still the Technical Review Branch, which continues to perform only the technical screening process of the requisition. The requisitions are forwarded to procurement clerks in the Contracting Branch who enter the requisitions into APS. The documents are then forwarded to the appropriate supervisor who

assigns them to the purchasing agents for action. All awarding functions are now accomplished by the procurement agents on their personal computers at their workplace and printed on laser printers located in the Contracting Branch. APS eliminated the need for a typing pool. Upon successful printing of the award document, the award is forwarded for signature to the supervisor, if required. Copies are distributed only to the Fiscal Department because the award information is electronically transferred to the Receiving Section and Control Branch. Both Receiving and Receipt Control utilize their own laser printer to make their copies. All award information is now electronically available in APS.

E. DATA ANALYSIS

APS was implemented in March 1993. The timeframe for data analysis included data from October 1991 to March 1993 for pre-APS implementation and April 1993 to September 1994 for post-APS implementation. This data was obtained from locally produced productivity reports and the DD1057 Monthly Contracting Summary of Actions $25,000 or Less reports.

1. Requisitions Received

Data for requisitions received was analyzed from March 1992 to March 1993 for pre-APS data and April 1993 to September 1994 for post-APS data. The source for this data was locally generated productivity reports.

Appendix H, details the relative steady state of requisitions received over the pre-APS and post-APS period. Prior to APS implementation, average requisitions received were 1999, while post-APS data reflected 1994 average requisitions received, a decrease of 5 requisitions or .002 percent. Relatively no change. In June 1994, 2767 requisitions were received by the Contracting Branch, the most since APS implementation. This unexpected increase had a

significant impact on the branch's backlog and PALT, as detailed in the following analysis of these variables.

2. Documents Awarded

The number of documents awarded by the Contracting Branch are based on the same period of time as requisitions received. The data source for awards was also from the same management productivity reports.

Appendix I, details a slightly decreasing trend in documents awarded. This follows the same rational, as requisitions received decreases, so will awards. The APS consolidation function may have been the strongest factor contributing to this decrease in award documents. Prior to APS, average awards per month was 1524, while post APS data averaged 1368 awards, a decrease of 156 awards or 10 percent.

3. Backlog, Work in Progress

Backlog data was obtained over the same period as the first two variables and from the same source.

Appendix J shows a significant increasing trend in backlog of requisitions since APS implementation. Prior to APS, average backlog per month was 151 requisitions, both in the typing pool and work-in-process on procurement agents desks. Post-APS data reflected an average backlog of 428 requisitions per month, an increase of 277 requisitions or 65 percent. However, when the backlog outliers for the last four periods were taken into consideration, average backlog was 312 requisitions per month, although still a significant increase of 48 percent. Some of the reasons for this increase in backlog was attributed to the considerable increase in requisitions received over the summer months, particularly June and July. This unexpected increase of requisitions received combined with summer leave had a definite impact on the increase in backlog during this period.

4. PALT

The data for PALT was not available on a monthly basis. PALT information was obtained from the DD 1057 report, prepared on a semi-annual basis. The timeframe for this data spans from October 1991 to March 1993 for pre-APS data and April 1993 to September 1994 for post-APS data.

Appendix K, details the trend in PALT over the combined pre and post-APS implementation period. Average monthly PALT figures prior to APS implementation over three semi-annual reporting periods was 5.5 days for the combined priority group requisitions. Average monthly PALT after APS implementation was 9.9 days, an increase of 4.4 days or 44 percent.

One possible explanation for this increase in PALT was the absence of a suspension option in the APS software. Without this capability, procurement agents stopping processing action on a requisition for more information from a customer or for any other reason, could not stop the PALT counter in APS, hence those PALT days would still count. Previous PALT calculations recognized suspension of requisitions and did not include that lost time against PALT. APS also does not distinguish between workdays and weekends. Previous PALT figures did not include weekends or holidays. Finally, the last period of data reflected PALT over the last six month period of Fiscal Year 1994. Due to the influx of year-end requisitions, PALT for this period usually is higher than the first six month period.

5. Productivity Ratio

Productivity ratio data was obtained over the same time periods as PALT. The DD 1057 was the source for this information. These figures were not available on a monthly basis but were calculated from data on a semi-annual basis. The productivity ratio was determined by dividing Total Contracting Actions by Buyer Operation Hours from the DD1057.

Appendix L, details the relative straight-line trend over the entire data analysis period. The average productivity ratio prior to APS implementation was .336. Average productivity ratio after APS was .360 an increase in productivity of .024 or approximately seven percent. This increase in the productivity ratio indicates that even though PALT and backlog have increased, the buying process is more efficient. This percentage rating is based on total buyer operation hours, in contrast to measures at NNMC, which are based solely on buyer productive hours, time actually spent placing an order. No direct comparison can be made between these figures.

F. DATA SUMMARY

While requisitions received remained in a relatively steady state over the evaluation period, key PALT and backlog data reflected an increase in days and requisitions, respectively. This would seem to indicate a negative effect on productivity. However, the productivity ratio has shown an increasing trend during this same period, indicating that the process became more efficient.

Although implementation of APS did not show a definitive increase in buyer productivity, automation was received with open arms by the personnel at NMC Portsmouth. APS allowed the Contracting Branch to eliminate several redundant steps under their previous process. While RATS provided a small degree of automation, its sole function was to track a requisition for status. APS allowed for automation during the entire life-cycle of the award process.

As with the NNMC, NMC Portsmouth recognized significant improvement in their Receiving Section and Receipt Control Branch. Frustrated freight was reduced at the receiving dock because of immediate access to documents, as a result of the laser printer. APS benefited the Receipt Control Branch by

expediting the bill paying process, saving on interest paid to vendors and allowing for increased discounts to be taken on contracts.

Interviews conducted with both management personnel and procurement agents have given the APS system very positive reviews. Visibility of a requisition through its acquisition life cycle and access to key productivity reports were cited as the greatest advantages by management, as well as the elimination of a typing pool. Procurement agents were pleased with the ability to perform the entire award process themselves, on a personal computer.

VII. NAVAL MEDICAL CENTER, OAKLAND CA

A. INTRODUCTION

The Naval Medical Center (NMC), Oakland CA, also referred to as Oak Knoll, was commissioned on July 1, 1942. NMC, Oakland provides comprehensive inpatient and outpatient medical care to over 125,000 active duty and retired personnel and dependents from Northern California and Western Nevada. NMC, Oakland also provides medical and support personnel to the USNS MERCY, currently homeported in Oakland. NMC Oakland is currently the home for the San Francisco Medical Command, however, the hospital is tentatively scheduled for closure on September 30, 1996. (NMC Oakland, 1994)

The Contracting Department of the Directorate for Logistics, provides acquisition support to the hospital and for the following tenant commands and Branch Medical Clinics:

- Naval School of Health Sciences (NSHS)

- San Francisco Medical Command

- Navy Drug Screening Lab

- Naval Air Station, Alameda, CA

- Naval Weapons Station, Concord, CA

- Naval Station, Mare Island, Vallejo, CA

- Naval Communication Station, Stockton, CA

- Naval Station, Treasure Island, San Francisco, CA

The Contracting Department has been delegated contracting authority up to $25,000 for open purchase orders and up to the MOL on items ordered under Federal Supply Schedules. The department also utilizes the same procurement methods as the other three Naval hospitals and is bound by the same contracting regulations.

NMC, Oakland was just recently reviewed by the PMR team in March 1994 and was awarded a fully successful rating.

B. ORGANIZATIONAL STRUCTURE

The Contracting Department is headed by a civilian GS-12, 1102 series, Contract Specialist and a military, Assistant Department Head.   The department is divided into two divisions, the Contracts Division and the Operations Division. The Operations Division is further divided into two sections, Purchasing and Receipt Control.

The Contracts Division is responsible for processing annual contracts for maintenance, subscriptions, healthcare services. etc.   This division also liaisons with the Fleet Industrial Supply Center (FISC), Oakland and the Naval Regional Contracting Centers (NRCC), in San Diego and Long Beach for orders exceeding their procurement authority.

The Receipt Control section of the Operations Division is responsible for processing the invoices from the award documents for payment to the vendors.

The Purchasing section of the Operations Division provides the day-to-day acquisition support for the hospital and the tenant commands and is the source for my data analysis.   The Purchasing section maintains eight procurement agents, ranging from GS-05 to GS-07, 1105 series, and one GS-1104 procurement clerk, who provides buying support.   There was no reduction or addition of procurement agents during the period of my data analysis.

Two other sections which play a role in the acquisition process are the Technical Review section and the Customer Service section.   These two sections are organized under the Head for Material Management.   The Technical Review section is responsible for screening customer requisitions and determining the availability of the requested items through the standard stock system.   The Technical Review section also

40

enters the locally generated requisition request document, the NMCNWR 4270/1 Procurement Request form, from the customer into APS. The Customer Service section is primarily responsible for providing status of requisitions to their customers.

C. DOCUMENT FLOW PRIOR TO APS

Requisition flow prior to APS was as follows: Customer requisitions, the NMCNWR 4270/1 Procurement Request, were submitted to the Technical Review section to determine the appropriate route of acquisition, through the standard stock system or through open market acquisition. If the items were not available through the standard stock system, the document was forwarded to the Purchasing section and was entered into a locally developed automated requisition tracking system. The requisitions were forwarded to the Operations Division Head, who assigned them to the procurement agents based on current agent workload. The buying process was performed manually by the procurement agents and upon completion of the award and proper signatures, the documents were forwarded for typing to a typing pool. Upon completion of the typed document, appropriate signatures were obtained and copies of the final documents were distributed to Receipt Control, Receiving, and Fiscal.

D. DOCUMENT FLOW AFTER APS

The entry point for customer requisitions remains the Technical Review section. The Technical Review section, after completing the screening process and determining the open market route of supply, enters the requisition information into APS. The documents are forwarded both physically and electronically to the Operations Division Head, who assigns the requisitions to the procurement agents. Procurement agents place their orders into the system, utilizing the personal computers at their desks, and print their award documents directly off the laser printers located in the

section. Appropriate signatures are obtained, based on buyer signature authority, and a copy of the award document is forwarded to the Fiscal Department. Award information is electronically transferred to Receipt Control and Receiving, who now have the ability to print their copies on their own laser printers. As a result of APS, the typing pool was eliminated and typists were reallocated as procurement clerks.

E. DATA ANALYSIS

APS was implemented in April 1993. The timeframe for data analysis included data from October 1991 to March 1993 for pre-APS data and April 1993 to September 1994 for post-APS data. Sources utilized for this data included DD 1057 documents and weekly purchasing agent productivity reports.

1. Requisitions Received

The timeframe in which requisitions received were analyzed included data from August 1992 to July 1994. The source for this data was the weekly productivity reports compiled by management personnel.

Appendix M, depicts a decreasing overall trend in requisitions received by the Contracting Department during the analysis period. Average requisitions received prior to APS implementation was 937. The number of average requisitions received after APS implementation was 878, a decrease of 59 requisitions or 6 percent.

The Prime Vendor program for pharmaceuticals was initiated in November 1993 at NMC Oakland and may have had an impact on the decreasing number of requisitions for open market procurement. Appendix M, reflects this decrease in requisitions below the trend from November to July 1994, with the exception of March.

2. Documents Awarded

The number of documents awarded by the Contracting Department was based on the same timeframe as requisitions

42

received and was acquired utilizing the same source of data, weekly productivity reports.

While the average number of requisitions received decreased after APS implementation, the average number of documents awarded slightly increased after APS implementation. Pre-APS data reflected 870 average documents awarded per month, while post-APS data reflected 881 average documents awarded per month, an increase of 11 awards per month or approximately one percent. Although this variable increased, the increase was not significant.

Appendix N, despite the small increase in average documents awarded, reflects a decreasing trend in awards over the entire data analysis period, consistent with the trend noted in the requisitions received variable.

3. Backlog, Work in Progress

Backlog data was obtained over the same period as requisitions received and documents awarded. The data source for this information was the weekly productivity reports. Total monthly backlog was derived from the ending backlog for the final week of each month.

Average backlog per month prior to APS implementation was 237 requisitions. Average backlog per month after APS implementation reflected 276 requisitions per month, an increase of 39 requisitions or approximately 14 percent. However, Appendix O, graphically depicts a steadily decreasing trend over the entire analysis period. Post-APS data and conversations with management indicate that the Contracting Department was greatly affected by the initial learning curve involved with the system. The learning curve combined with the increased number of requisitions received during the months of March and April 1993, significantly increased backlog during the periods of April and May 1993. Further data analysis on average backlog for the period of October 1993 to July 1994 reflected a backlog average of 125

requisitions per month. When compared with the pre-APS average of 237 requisitions per month, this was a significant decrease of 112 requisitions per month or 47 percent.

4. PALT

Data for PALT analysis was obtained during the same timeframe and from the same productivity reports as the previous three variables.

Average monthly PALT prior to system implementation was 5.42 days. Average monthly PALT after APS implementation was 11.53 days, an increase of 6.11 days or 47 percent.

Although average monthly PALT showed a significant increase, Appendix P, reflects a small increase over the entire period. The PALT data seemed to correlate with the increase in average backlog over the same time period in April, May and June of 1993. Again, the increase in the requisitions received and the learning curve effect during this period appeared to have a major impact on PALT data. Further data analysis of average PALT from the period of October 1993 to July 1994 indicated an average monthly PALT of 7.39 days an increase of only 1.73 days or 23 percent, from pre-APS data.

5. Productivity Ratio

Productivity ratio data was obtained from DD 1057 reports, spanning six semi-annual periods from October 1991 to September 1994. Pre-APS data includes reports from October 1991 to March 1993, while post-APS data includes reports from April 1993 to September 1994.

The average productivity ratio prior to APS implementation was .55. The average productivity ratio after APS implementation was .72, an increase of .17 or 23 percent. This trend, graphically depicted in Appendix Q, reflects a increase in buyer efficiency over the total analysis period. However, the last two semi-annual periods indicate a decreasing trend in the productivity ratio.

F. DATA SUMMARY

Requisitions received and documents awarded during this analysis period displays only a minimal decreasing trend, while analysis of backlog reflects a substantial decreasing trend. This indicates what one would hypothesize; that as requisitions received decreases, backlog will follow and decrease as well. Although backlog reflected a higher monthly average after APS implementation, the average was skewed by learning curve outliers for the first few months after system implementation. The steeper trend reduction in backlog compared to requisitions received is the important factor to recognize. Previous to APS, all purchase orders were procured as confirming orders, as a result of backlog in the typing pool. By confirming all the purchase orders many duplicate shipments were being received, entailing the preparation of many modifications. APS eliminated this problem.

PALT figures show a minimal increasing trend over the data analysis period. This minimal increase combined with APS's inability to suspend documents and disregard weekends and holidays when calculating PALT, could actually result in a small reduction in PALT. The increase in the productivity ratio over the entire data analysis period indicates that the APS system has helped to maintain an efficient process in the Contracting Department. It should be noted that the ratio was on the rise prior to APS implementation, as a result of management initiatives. However the decrease during the last two periods could be an indication of a downward trend. Analysis of the next semi-annual period would prove interesting.

In the case of NMC Oakland, productive benefits of APS are more evident during data analysis then at the other three medical facilities. The purchasing agents are generally happy with the system and management enjoys the increased reporting capabilities. Like NMC Portsmouth, automation at NMC oakland

was practically non-existent. The advantage of automation and the ability of the procurement agents to control the entire buying process on their computer, at their desk, seemed to have a positive effect on department morale.

As with the other hospitals in this study, NMC Oakland also recognized additional benefits in the Receiving and Receipt Control areas, in terms of reduced frustrated freight and decreased interest payments, respectively.

VIII. NAVAL MEDICAL CENTER, SAN DIEGO CA

A. INTRODUCTION

The Naval Medical Center, San Diego, also commonly referred to as Balboa Naval Hospital, is the largest Naval hospital and among the largest military hospitals in the world. NMC San Diego is responsible for providing comprehensive healthcare to approximately 500,000 eligible beneficiaries in San Diego County and the surrounding areas. NMC San Diego is a major Graduate Medical Education (GME) teaching hospital and provides staff for five medical mobilization teams and two fleet surgical teams to support operational readiness. (NMC San Diego, 1994)

The Acquisition Management Division, one of four divisions reporting to the Materiel Management Department Head, is responsible for providing acquisition support to the hospital as well as the following tenant commands and Branch Medical Clinics:

- Naval Drug Screening Lab

- Naval School of Health Sciences (NSHS)

- Healthcare Support Office (HSO), San Diego

- Tricare office

- Branch Medical Clinic, Naval Station

- Branch Medical Clinic, Naval Amphibious Base, Coronado

- Branch Medical Clinic, Naval Air Station, North Island

- Branch Medical Clinic, Naval Training Center

- Branch Medical Clinic, Marine Corps Recruit Depot

- Branch Medical Clinic, Naval Air Station, Miramar

- Branch Medical Clinic, Naval Air Facility, El Centro

NMC San Diego has been delegated contracting authority up to $25,000 and to the MOL on items ordered under Federal Supply Schedules. NMC San Diego utilizes the same ordering methods as the NNMC, NMC Portsmouth and NMC Oakland and is bound by the same contracting regulations.

B. ORGANIZATIONAL STRUCTURE

The Acquisition Management Division is organized into four branches, Procurement, Receipt Control, Customer Service, and Technical Review.

The Procurement Branch is headed up by a civilian GS-12, 1102 series, Contract Specialist, with a military Assistant Division Head. The branch is organized into two teams, A and B, and currently consists of 11 procurement agents, combined. Previous to APS and during a period after APS, 12 procurement agents were assigned. These teams are commodity and customer based and provide the day-to-day acquisition support for the hospital and the other facilities previously mentioned. Both teams are supervised by a civilian GS-11, 1105 series, Supervisory Purchasing Agent. The Division also staffs a civilian GS-11, 1102 series, Contract Specialist, who coordinates annual contracts and liaisons with NRCC San Diego on contracts exceeding NMC San Diego's purchase authority. Another GS-11, 1102 series, Contract Specialist, performs the functions of a Workload Manager and is responsible for distributing requisitions to the procurement agents.

The Receipt Control Branch, like at the other three hospitals, processes award documents for payment to the vendor and is not part of the initial acquisition process.

The Customer Service Branch is responsible for receiving customer requisitions and screening vendors. Customer Service is staffed by two military personnel.

The Technical Review Branch screens the requisitions to ensure the items requested are not available through the

standard stock system. This branch is staffed by one civilian GS-09 and two military personnel.

C. DOCUMENT FLOW PRIOR TO APS

Requisition flow prior to APS implementation was as follows: Customer Service would receive requisitions from customers on the NAVCOMPT 2276 document and date stamp the requisitions. Priority six requisitions were forwarded directly to the Workload Manager, while priority 13 requisitions were forwarded to Technical Review Branch. Upon review by the Workload Manager, priority six requisitions were then forwarded to the Technical Review Branch to be expeditiously processed separate from the priority 13's. Technical Review screened the requisitions for availability in the standard stock system. Upon completion of the screening process, the requisitions were forwarded to the Workload Manager who assigned them to the procurement agents.

Approximately one year prior to the implementation of APS, NMC San Diego began implementing a locally developed automated system referred to as the Requisition Processing System or RPSVII. The Procurement agents would place their orders utilizing this system. RPSVII semi-automated the previous manual process, which utilized a typing pool to type and complete award documents. After placing the order, the purchasing agent would print out the award document utilizing RPSVII and obtain the appropriate signature. Once signed, the documents were distributed by procurement clerks to the Receiving and Receipt Control Branches and to the Fiscal Department.

D. DOCUMENT FLOW AFTER APS

APS was implemented in January 1993 and the following document flow was instituted: Customer Service is still the receipt point for all customer requisitions. Requisitions are received and hand carried to the procurement clerks who enter

49

the requisitions into APS and submit them to the Technical Review Branch, electronically through APS and physically. Technical Review screens and stamps the requisitions and forwards them to the Workload Manager. The Workload Manager sorts the requisitions and reassigns them physically and electronically to the procurement agents, based on commodities, customers and buyer workload. All award processing is performed by the procurement agents at their desk and award documents are printed out on laser printers located in the division. After the appropriate review and signatures are obtained, a copy of the award documents are distributed to the Fiscal Department and award information is electronically forwarded to the Receipt Control and Receiving Sections. Receipt control and Receiving have access to laser printers to print their copies of the award.

E. DATA ANALYSIS

Data available for NMC San Diego encompassed information for the pre-APS period from October 1991 to January 1993 and the post-APS period from February 1993 to September 1994. Due to unavailability of monthly data and productivity reports, prior to APS implementation, backlog data and the productivity ratio could not accurately be ascertained. Available data included information obtained solely from the DD 1057 report in semi-annual periods. Since APS was implemented in January 1993, no clear division of data could be obtained from the DD 1057 for the period of October 1992 to March 1993. This period includes four months of pre-APS data and two months of post-APS data.

1. Requisitions Received

The timeframe in which requisitions received was analyzed included data from October 1991 to September 1994.

Appendix R, depicts an increasing trend in the number of requisitions received over the data analysis period. The last

period, March 1994 to September 1994, reflects a total of 10,582 requisitions received, the most received by the division during the entire data analysis period. This period included 1994 fiscal year-end data, in which NMC San Diego was inundated with several year-end requisitions.

Average requisitions received prior to APS implementation includes DD1057 data from October 1991 to September 1992. Average requisitions received over this period was 7615 per semi-annual period. Average requisitions received after APS implementation includes DD1057 data from April 1993 to September 1994. Average requisitions received over this period was 8733 per semi-annual period, an increase of 1118 requisitions or 13 percent.

2. Documents Awarded

Data for Documents awarded was analyzed over the same time periods as requisitions received for both pre-APS and post-APS periods.

As requisitions received increased, so did documents awarded. The last semi-annual period reflected a total of 9144 documents awarded, the highest total of all semi-annual periods reviewed. Appendix S, shows the increasing trend of award documents over the entire data analysis period.

Average documents awarded prior to APS implementation was 7487 per semi-annual period. Average documents awarded after implementation was 7977 per semi-annual period, an increase of 490 documents or six percent.

3. PALT

Data for PALT was obtained from the DD 1057 over the same time periods as the above two variables.

Appendix T, shows the relatively steady state of PALT during the entire data analysis period from October 1991 to September 1994. Average PALT prior to APS implementation was 10 days. Post-APS PALT figures averaged 10.3 days an increase of .3 days or three percent.

F. DATA SUMMARY

While it is unfortunate that monthly productivity data was not available for this thesis study, the data that was available from the DD 1057 report indicates that APS has had a positive effect on PALT at NMC, San Diego. Although average PALT figures showed a minuscule increase of .3 days, the relatively steady trend, combined with increasing workload and one less buyer position, indicates an increase in productivity and buyer efficiency.

Conversations with management personnel indicated the transition to APS was a painful one. Much like the environment at NNMC, the previous automated system RPSVII implemented in March 1993, although not a full function system like APS, was more user friendly and everyone was accustomed to the system. NMC San Diego was the second Naval hospital to receive the system and many of the system problems were still inherent and being evaluated during the time of implementation.

Interviews conducted with purchasing agents at NMC San Diego indicated a generally positive attitude with APS, now that it has been on-line for nearly two years. Management personnel indicated their pleasure with the standard reports generated by APS and the ability to develop clause matrices. Management also was pleased with the ability to determine life-cycle procurement status of requisitions and the many checks and balance features, which the RPSVII could not provide.

NMC San Diego additionally benefited, as did the NNMC, NMC Portsmouth and NMC Oakland, from the Receiving and Invoicing modules. Receiving was no longer inundated with frustrated freight, waiting for paperwork, and Receipt Control was able to maintain its low interest payments when processing documents for payment.

IX. CONCLUSION

The goal of this study was to determine the impact an Automated Procurement System (APS) has had on procurement productivity variables at the four Naval hospitals utilizing the system. Although the study indicates that variables such as backlog and PALT showed increases, in most cases, after implementation of APS, computed productivity ratios showed an increase in productivity at the three activities in which data was available for this measure, reflecting increased buyer efficiency.

Increase in PALT measures at all four hospitals were impacted by the inability of APS to distinguish between workdays and weekends and the software's inability to suspend documents. Hence, these measurement differences could account for only slight increases in PALT. Presently, modifications are being made to the system to initialize a suspension option in the SACONS-FEDERAL software, allowing purchasing agents the ability to suspend the PALT counter for documents requiring additional information from the customer. Reduced purchasing agent billets also affected PALT and backlog measures after APS implementation.

While different reasons could be cited for increases in backlog and PALT variables before and after APS implementation, this study was confined to the time period in which data was available and relevant. However, of more importance, the increases in backlog and PALT may be offset by the success of the overall system in other areas not directly evident in pure data comparison.

A. MAJOR BENEFITS

Major benefits cited by management personnel at the four hospitals included:

- Enhanced productivity and status reporting capabilities.

53

- Increased workload monitoring capabilities.

- Ability of purchasing agents to easily consolidate multiple requisitions into a single award.

- Laser printer generated award documents.

- Elimination of manual document preparation and typing pools.

- Procurement agent has complete responsibility for award and document generation.

- Integration of the procurement process with the receipt control and receiving functions.

- Readily available requisitions status through the life-cycle of the requisition.

- Matrix clause capability and local clause generation.

- Easily accessible vendor file and rotation capability.

- Automatic calculation of monthly data for DD 1057 Monthly Contracting Summary of Actions $25,000 or less report. (No semi-annual totaling capability)

- Increased checks and balances of system. Difficult awards could not be set aside for long periods of time.

- Eliminated time wasted searching for documents. Award information was easily available for copy prints by personnel in receipt control and receiving functions.

Implementation of the APS at these four hospitals was a difficult and frustrating process, mostly due to the implementation of the new and relatively untested version 3.1 of SACONS-FEDERAL. However, a majority of the system inadequacies have been identified by the NNMC, NMC Portsmouth, NMC Oakland and NMC San Diego over the last two years, paving the way for an easier transition for future BUMED activities contemplating this system.

Finally, the importance of strong leadership and management are paramount to the development, implementation, and successful utilization of a new information system. A new
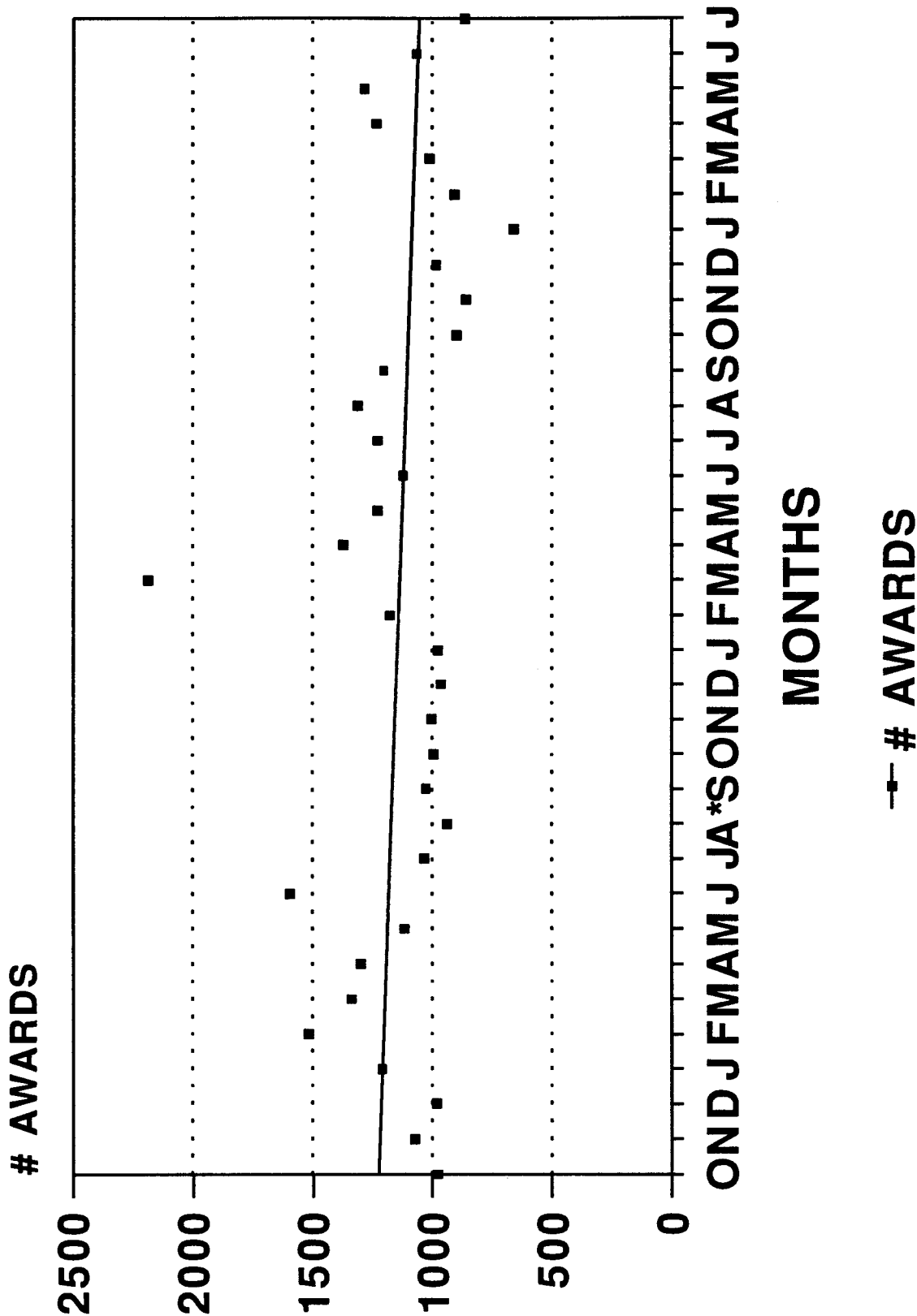
system is useless if it does not meet the organizations mission and goals as established by management. During APS implementation, strong leadership was necessary and evident at all four Naval hospitals.

B. AREAS FOR FURTHER RESEARCH

New initiatives including the ability to suspend PALT in the system, archiving, and electronic bidding options are being planned and added to the BUMED version of SACONS-FEDERAL. These new capabilities may provide increased opportunities to improve on PALT and backlog procurement productivity variables. Follow-on studies of APS may include analyzing the impact of the suspension and electronic bidding option on these same procurement productivity variables. Additional studies could also focus on a similar in-depth analysis of productivity indicators for receipt control and receiving functions at these facilities, before and after APS implementation.
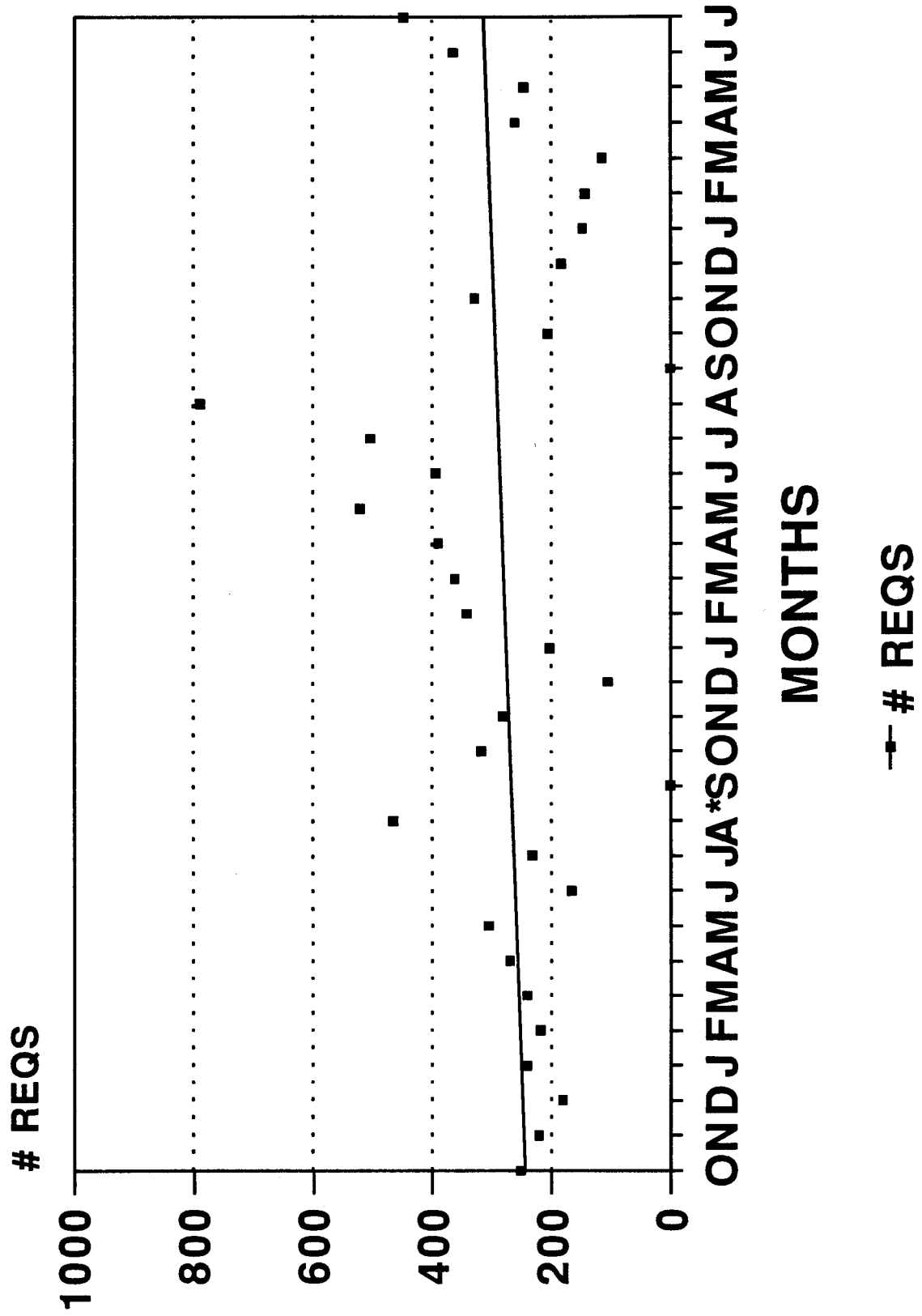
NNMC REQUSITIONS RECEIVED

PRE & POST APS

REQS

2500

2000

1500

1000

500

0

ONDJFMAMJJA*SONDJFMAMJJASONDJFMAMJJ

MONTHS

— # REQS

* APS INSTALLED AUG 92

NNMC DOCUMENTS AWARDED
PRE & POST APS

AWARDS

2500 2000 1500 1000 500 0

ONDJFMAMJJA*SONDJFMAMJJASONDJFMAMJJ

MONTHS

AWARDS

* APS INSTALLED AUG 92

59

NNMC BACKLOG (WIP)
PRE & POST APS

 # REQS

1000
800
600
400
200
0

ON D J F M A M J J A*S O N D J F M A M J J A S O N D J F M A M J J

MONTHS

-■- # REQS

* APS INSTALLED AUG 92

61

NNMC PALT
PRE & POST APS

DAYS

MONTHS

-■- # DAYS
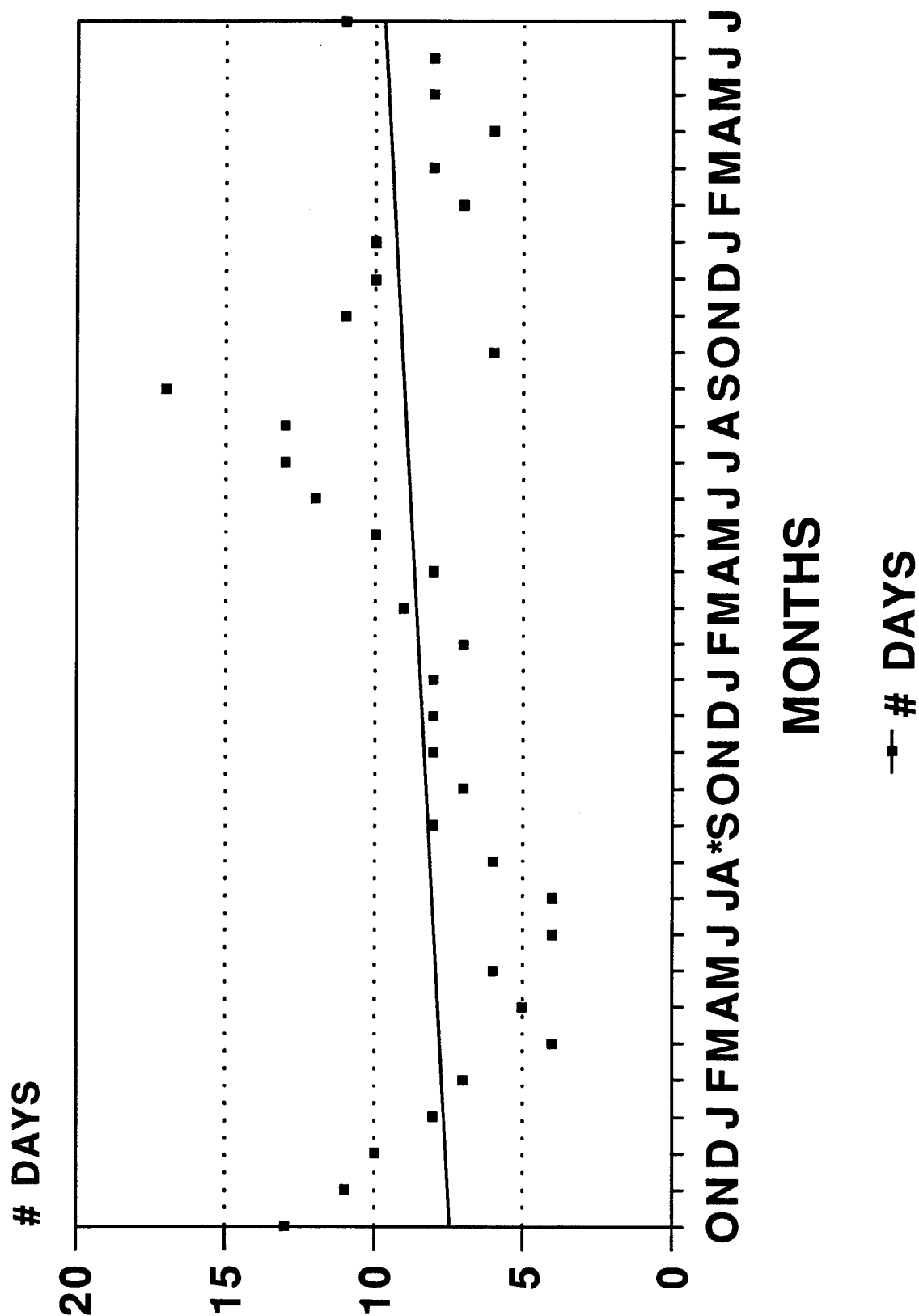
* APS INSTALLED AUG 92

NNMC PALT
PRE-APS
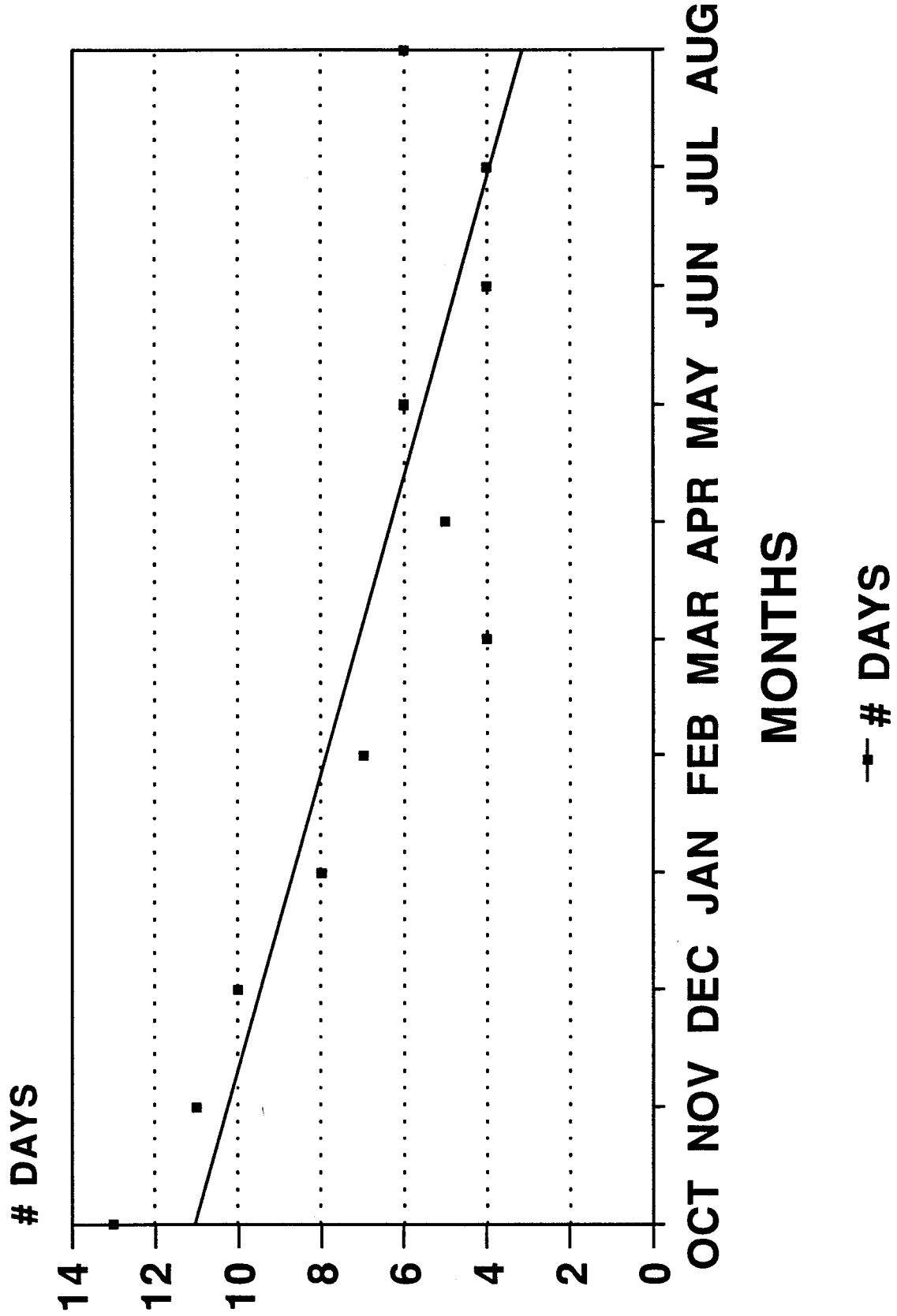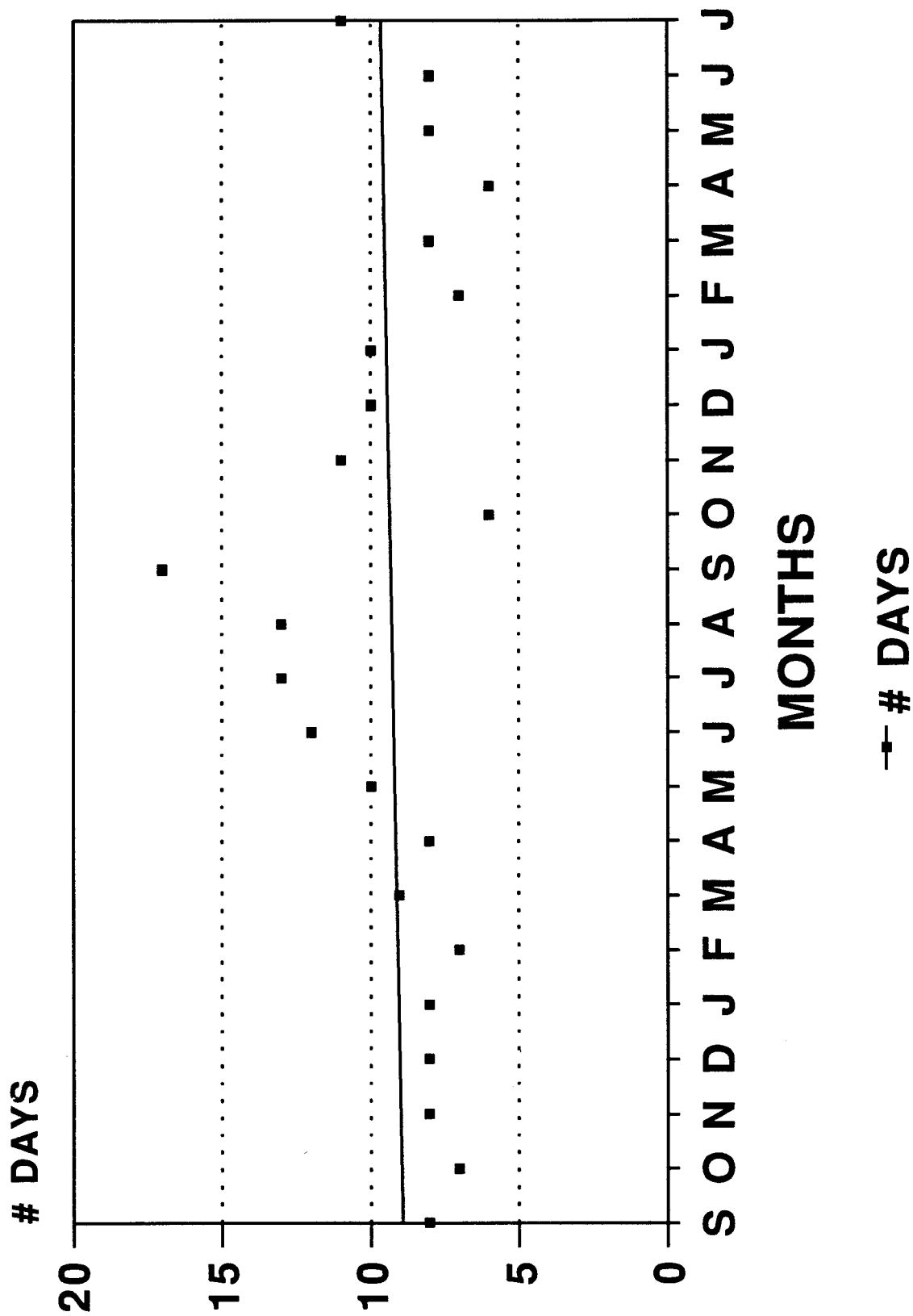
 # DAYS

OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG

MONTHS

━■━ # DAYS

OCT 91- AUG 92

65

NNMC PALT
POST APS

 # DAYS

MONTHS

-■- # DAYS

SEP 92- JUL 94

NNMC PRODUCTIVITY RATIO
PRE & POST APS

PRODUCTIVITY %

MONTHS

O N D J F M A M J J A*S O N D J F M A M J J A S O N D J F M A M J

-+- PRODUCTIVITY %

* APS INSTALLED AUG 92

69

NMC PORTSMOUTH REQUSITIONS RECEIVED
PRE & POST APS

APPENDIX H

REQS

MONTHS

M A M J J A S O N D J F M*A M J J A S O N D J F M A M J J

-■- # REQS

* APS INSTALLED MAR 93

71
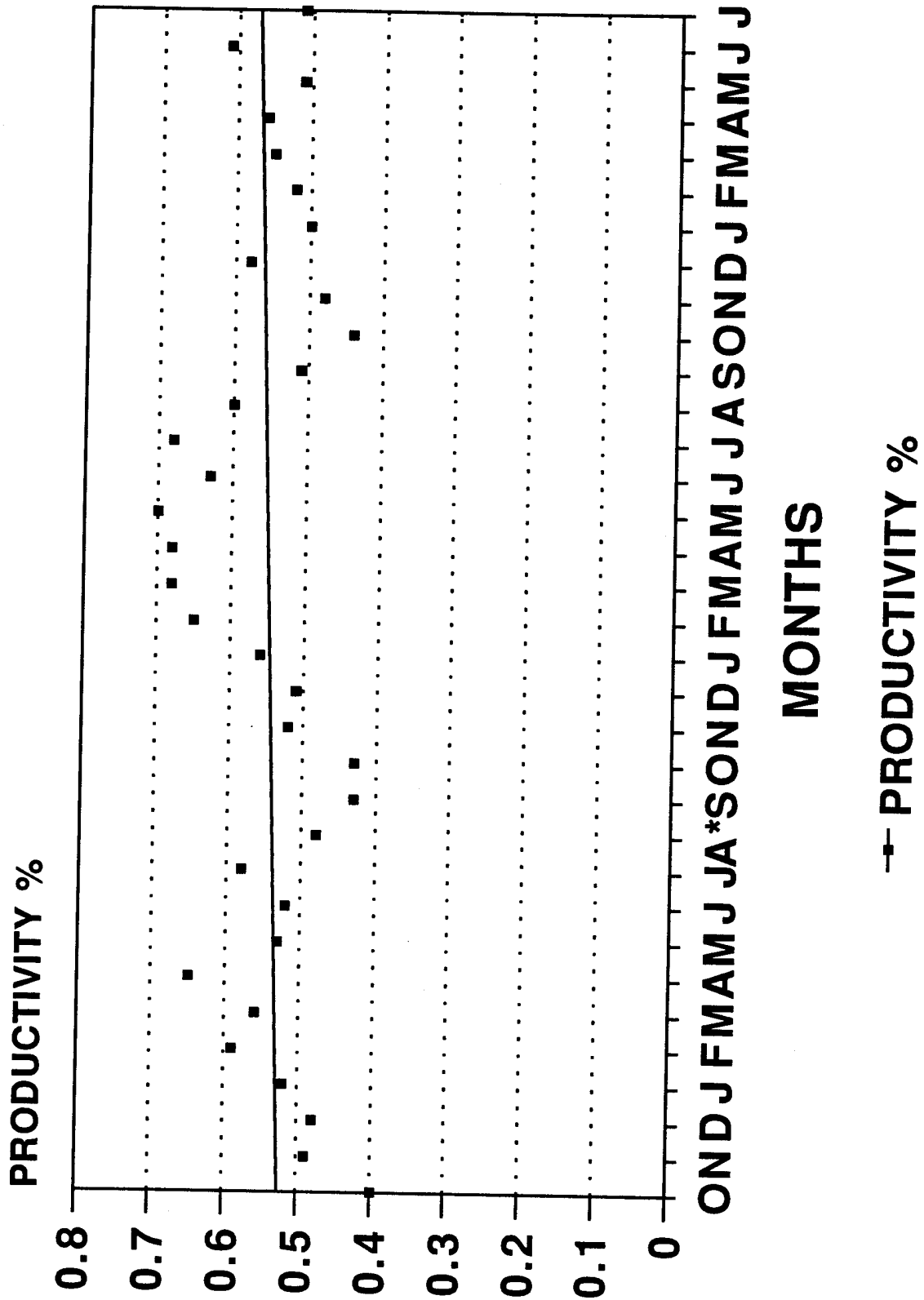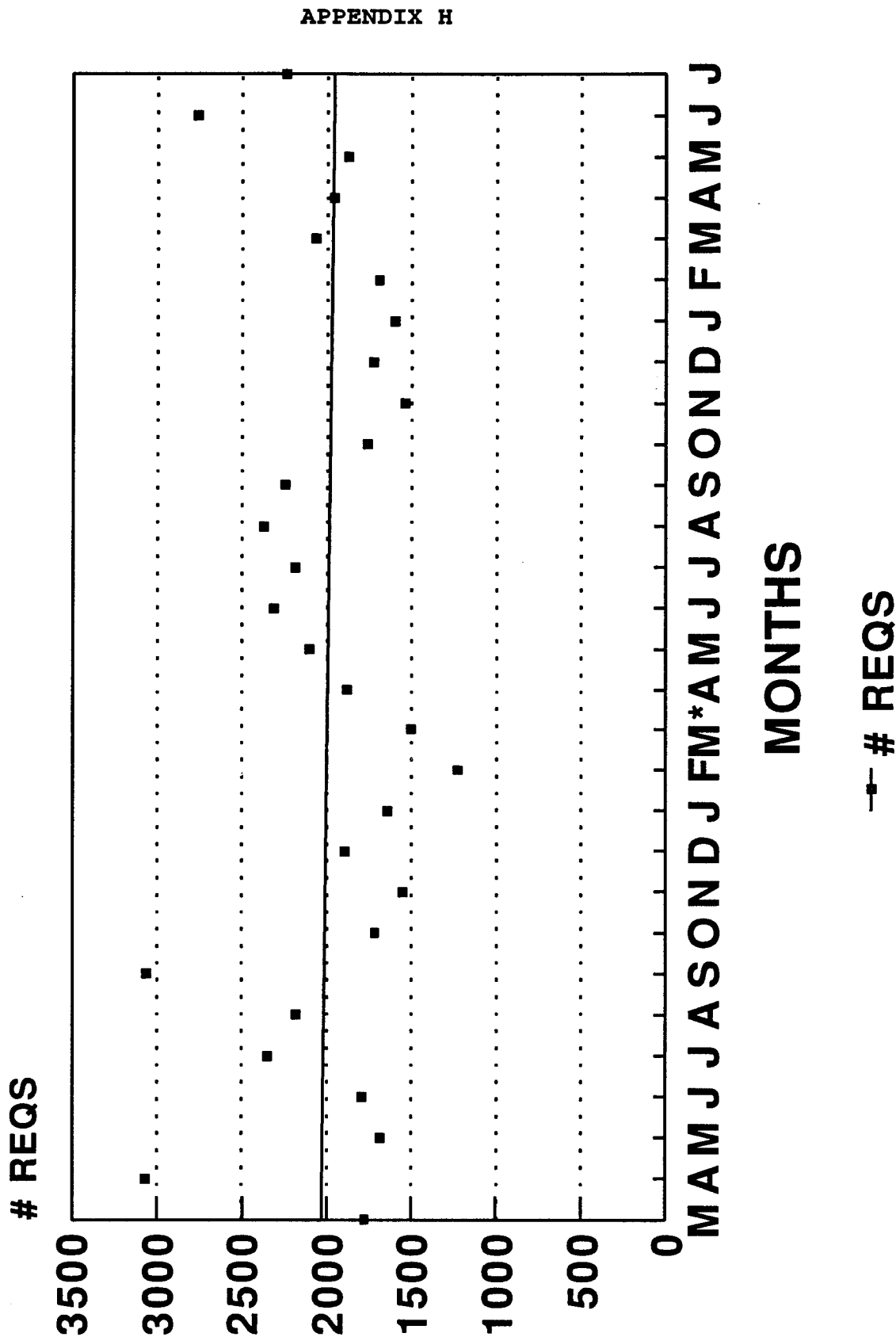
NMC PORTSMOUTH DOCUMENTS AWARDED
PRE & POST APS

AWARDS

3500
3000
2500
2000
1500
1000
500
0

MAMJJASONDJFMAMJJASONDJFMAMJJ

MONTHS

-■- # AWARDS
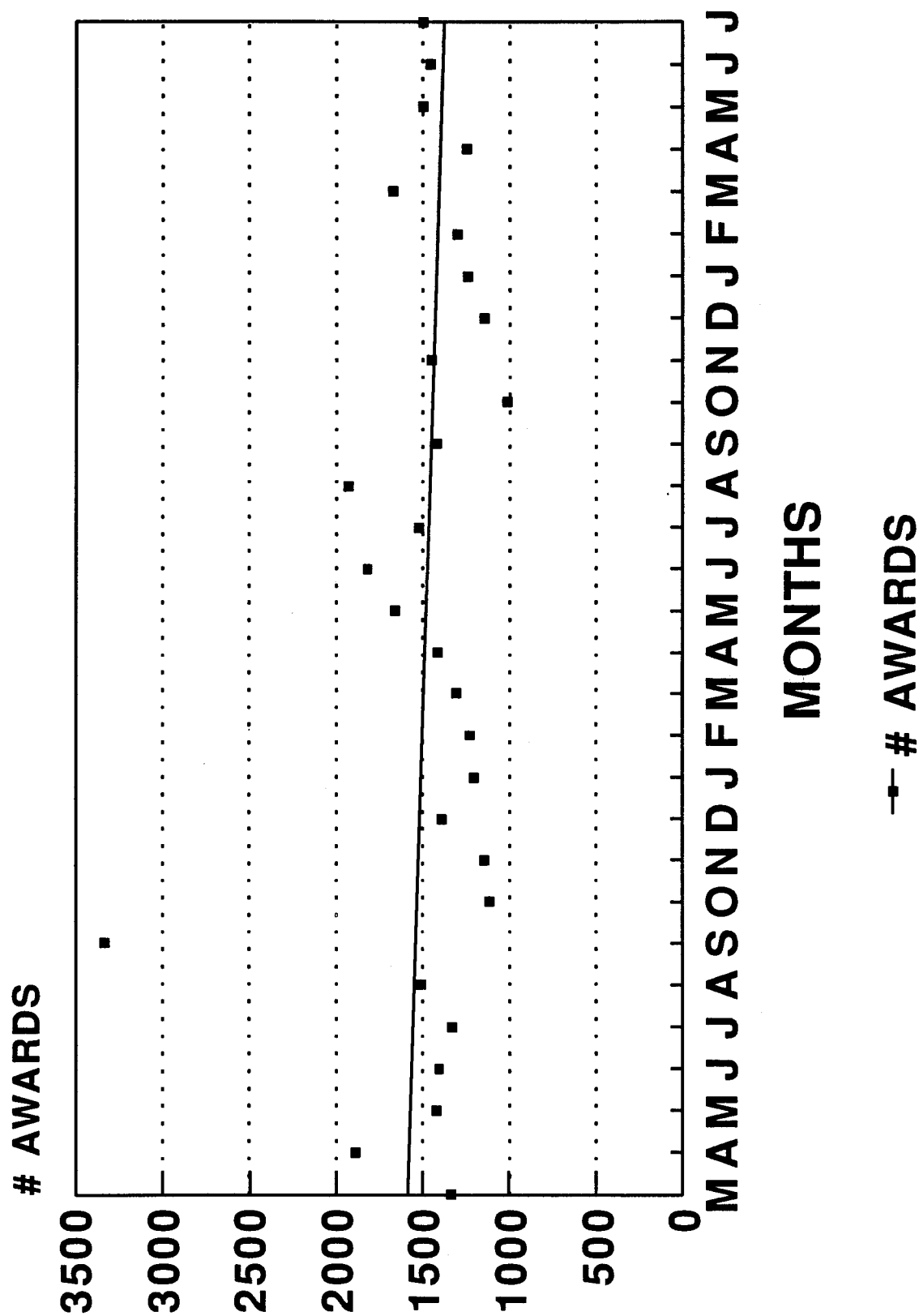
* APS INSTALLED MAR 93

73

NMC PORTSMOUTH BACKLOG(WIP)
PRE & POST APS

REQS

MONTHS

M A M J J A S O N D J F M*A M J J A S O N D J F M A M J J

--- # REQS
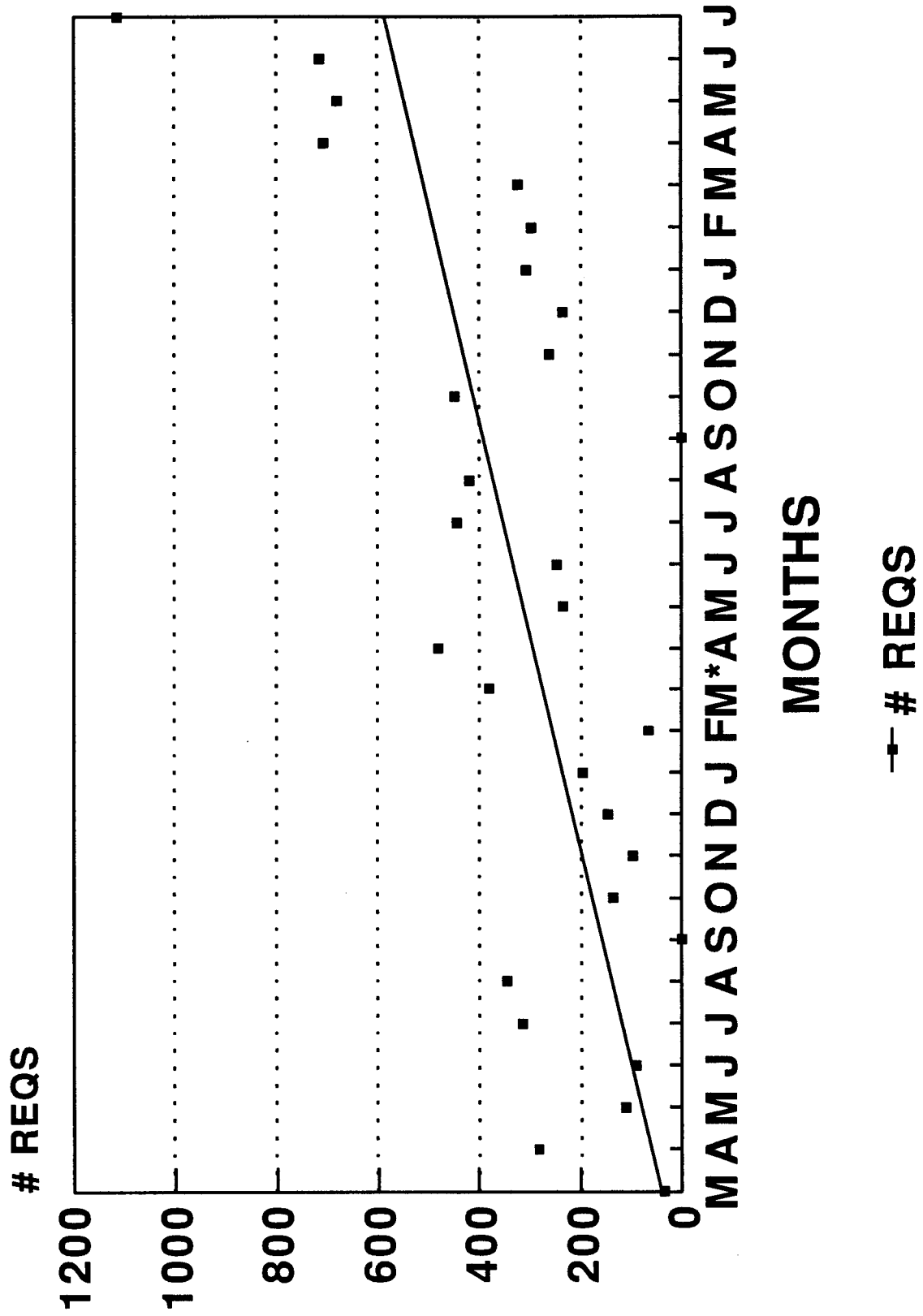
* APS INSTALLED MARCH 1993

75
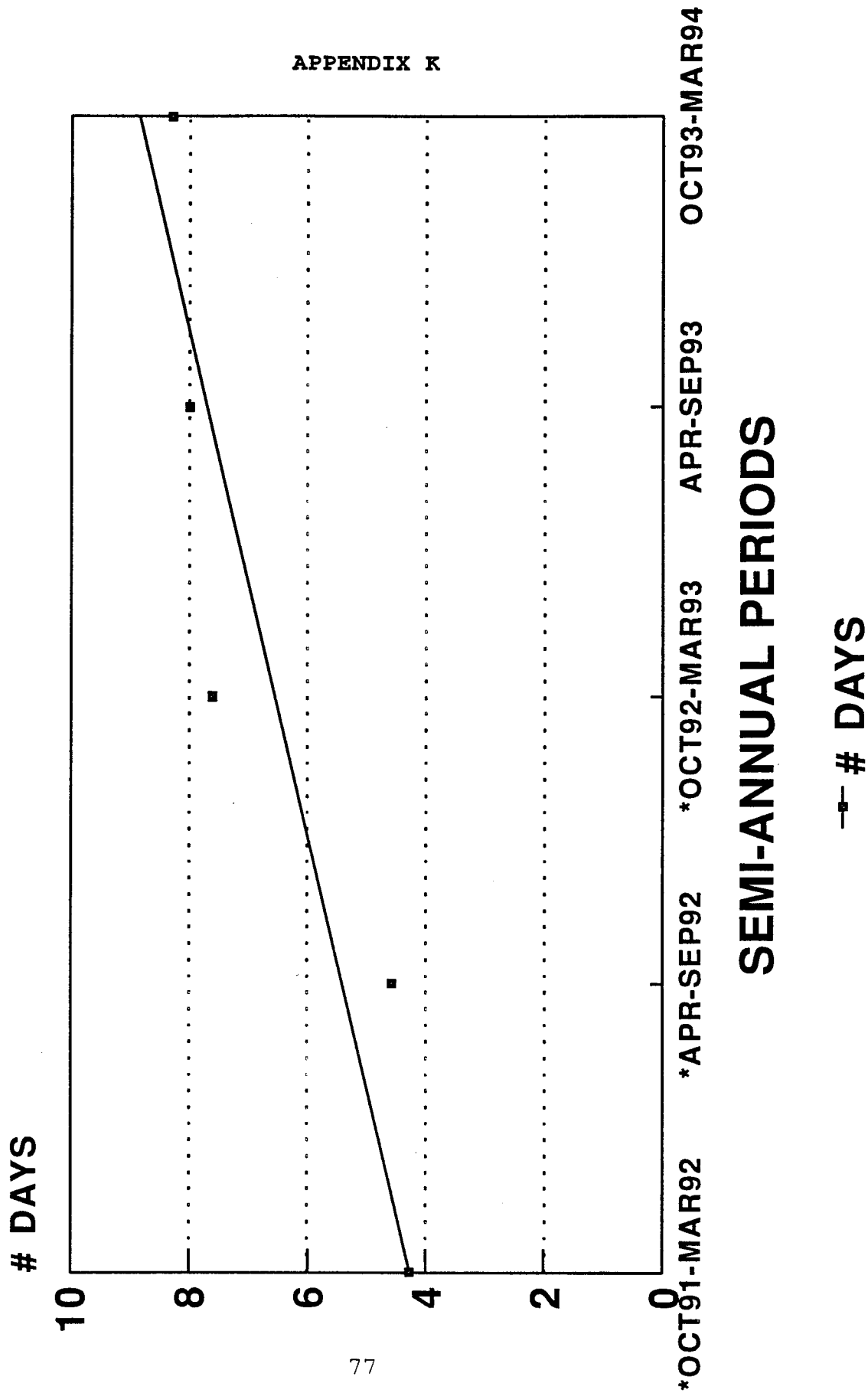
APPENDIX K

NMC PORTSMOUTH PRODUCTIVITY RATIO
PRE & POST APS

PRODUCTIVITY %

0.5

0.4

0.3

0.2

0.1

0

PRODUCTIVITY %

SEMI-ANNUAL PERIODS

*OCT91-MAR92 *APR-SEP92 *OCT92-MAR93 APR-SEP93 OCT93-MAR94 APR94-SEP94

-■- PRODUCTIVITY %

* PRE-APS PERIODS
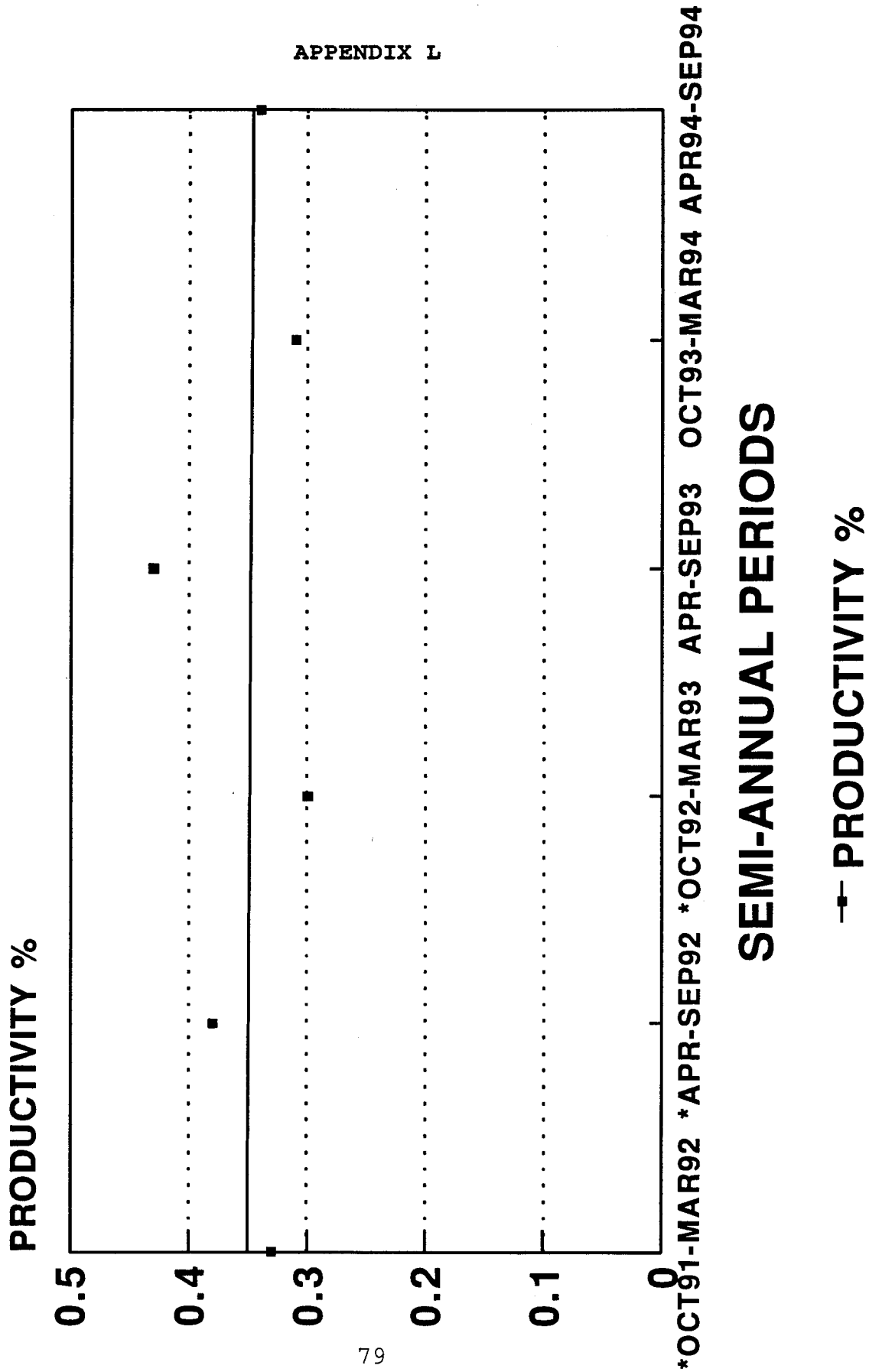
NMC OAKLAND REQUISITIONS RECEIVED
PRE & POST APS

APPENDIX M

REQS

MONTHS

REQS

* APS INSTALLED APR 93

81
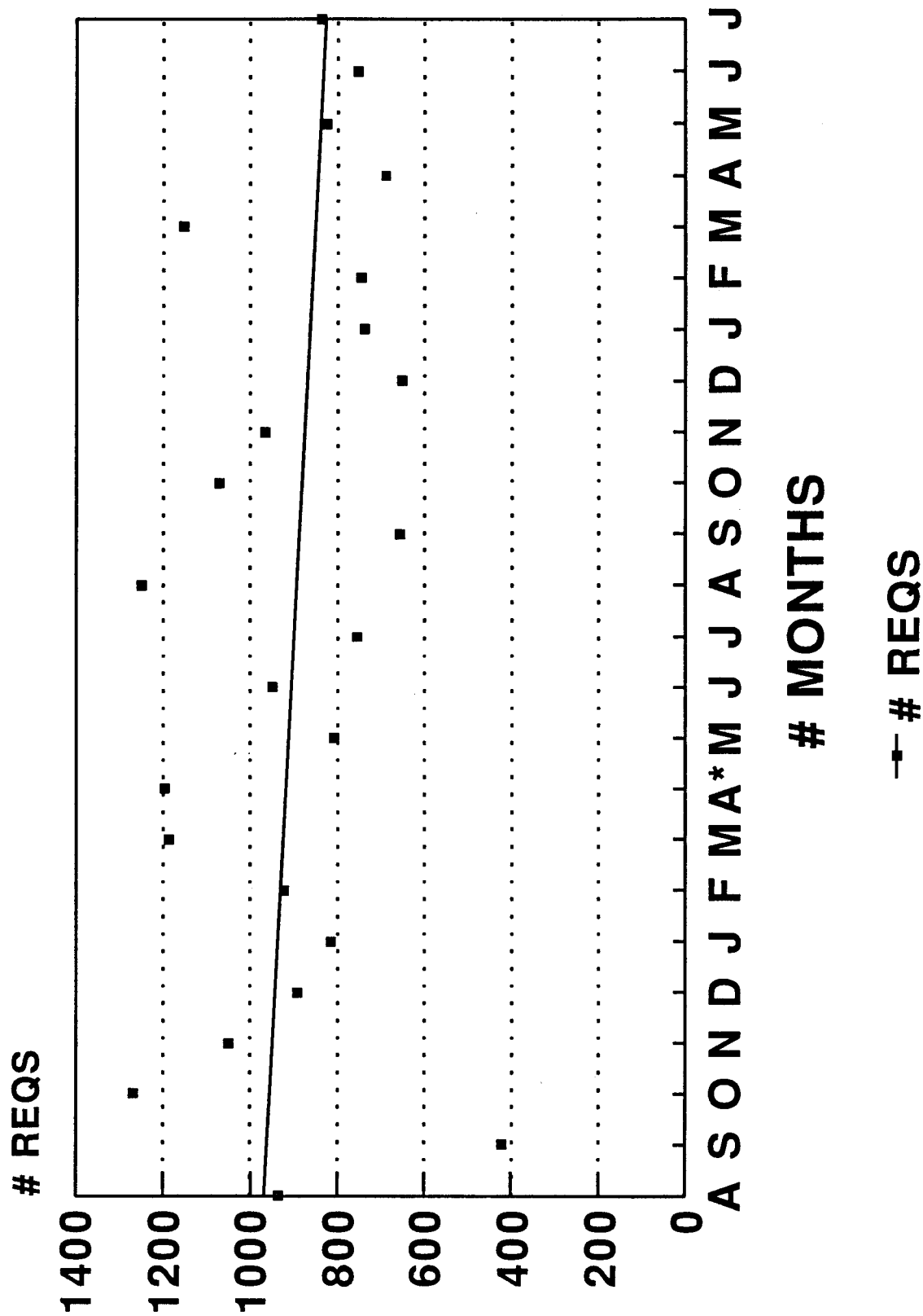
NMC OAKLAND DOCUMENTS AWARDED
PRE & POST APS

AWARDS

1400
1200
1000
800
600
400
200
0

A S O N D J F M A*M J J A S O N D J F M A M J J

MONTHS

-■- # AWARDS

*APS INSTALLED APR 93
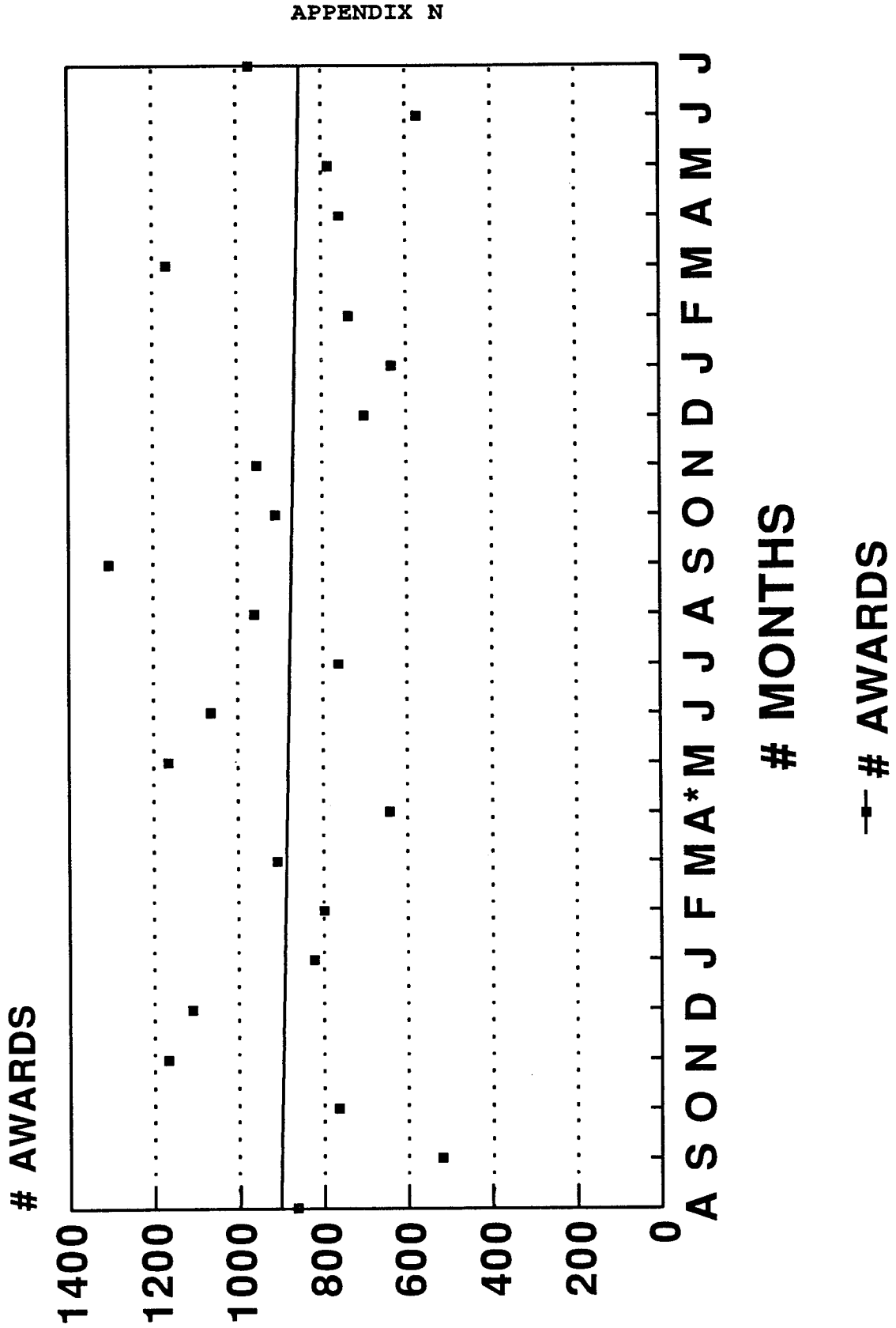
NMC OAKLAND BACKLOG(WIP)
PRE & POST APS

REQS

1200
1000
800
600
400
200
0

A S O N D J F M A*M J J A S O N D J F M A M J J

MONTHS

-■- # REQS

85
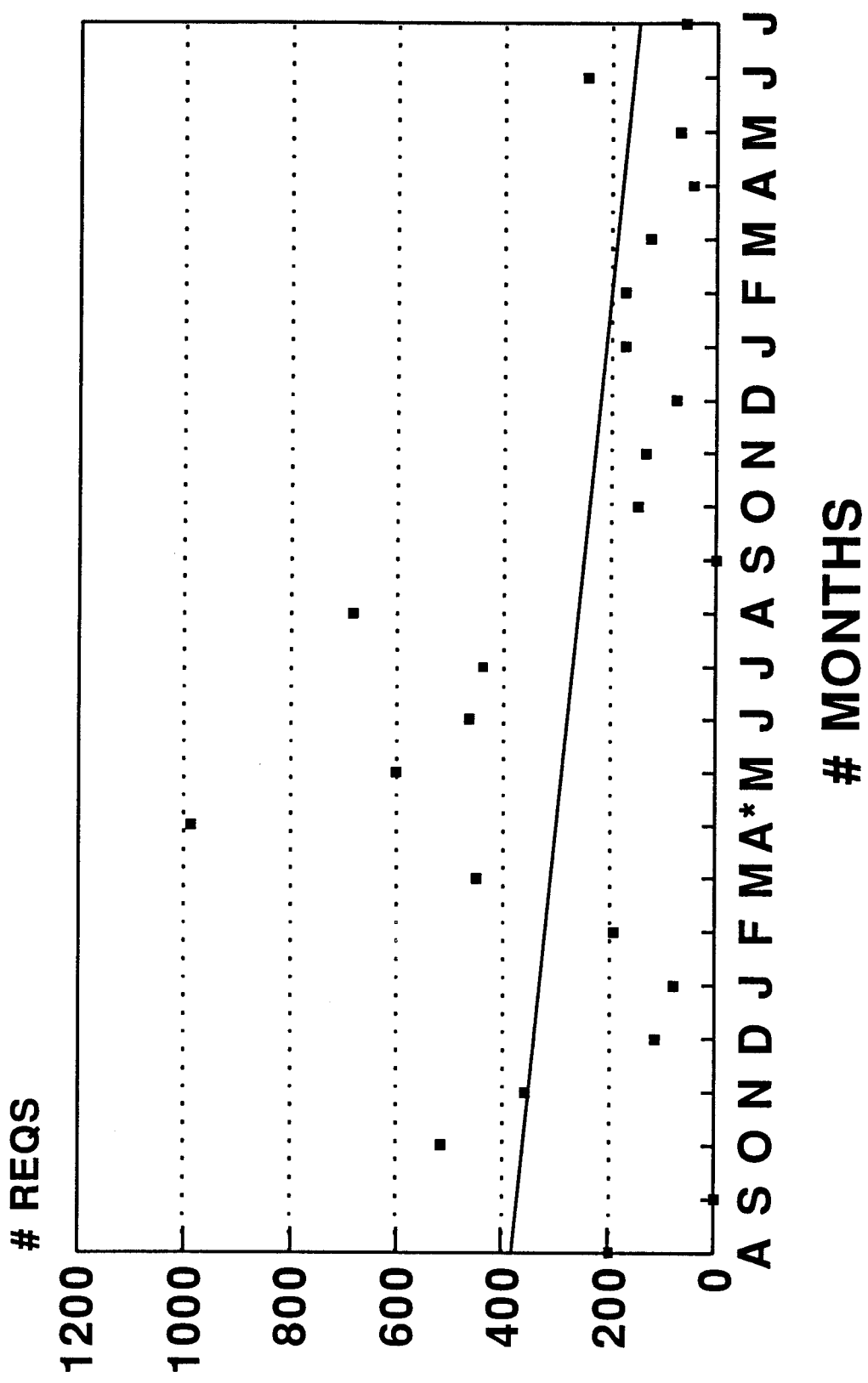
* APS INSTALLED APR 93

NMC OAKLAND PALT
PRE & POST APS

DAYS

MONTHS

-■- # DAYS

* APS INSTALLED APR 93

87

APPENDIX Q
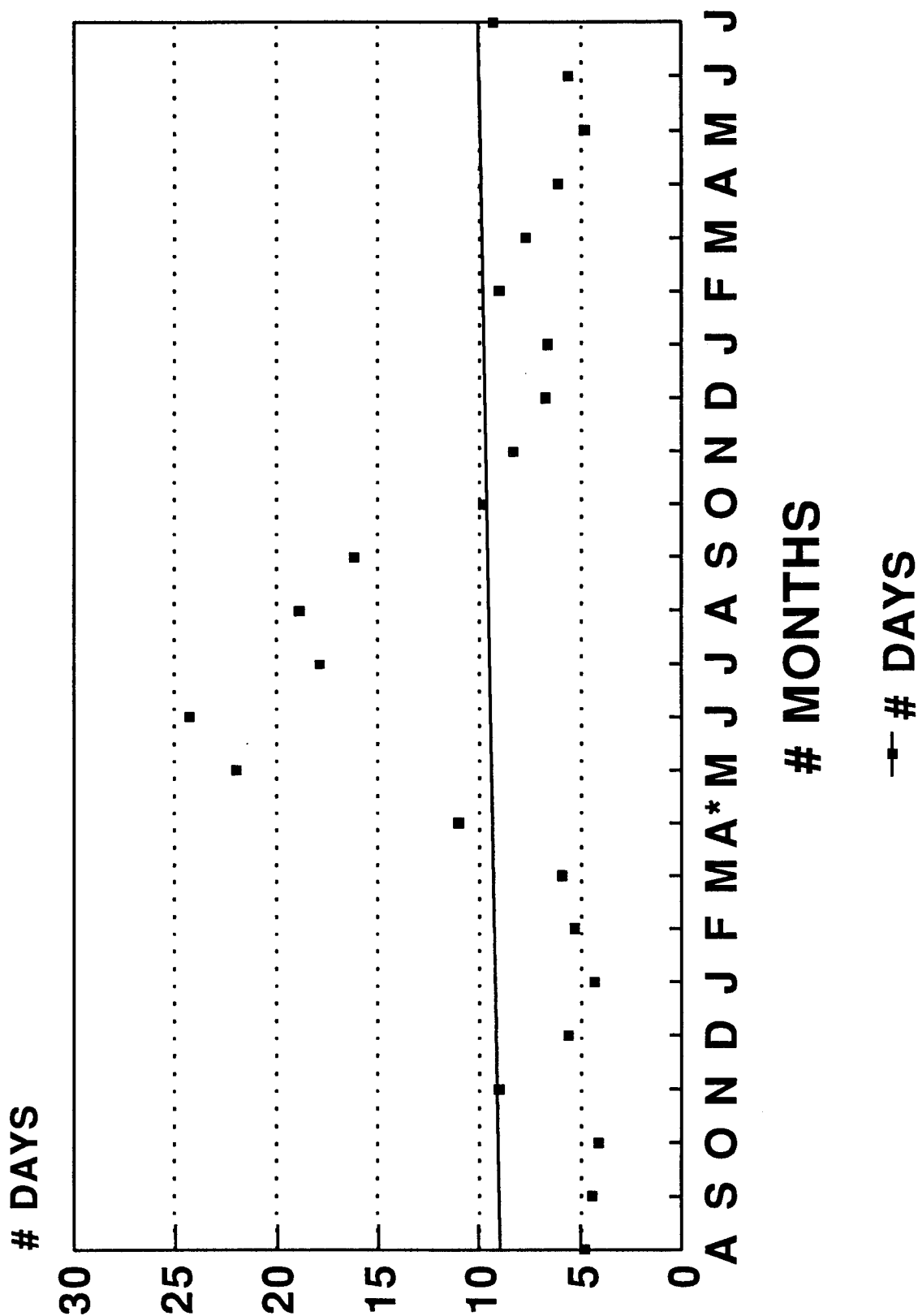
NMC OAKLAND PRODUCTIVITY RATIO
PRE & POST APS
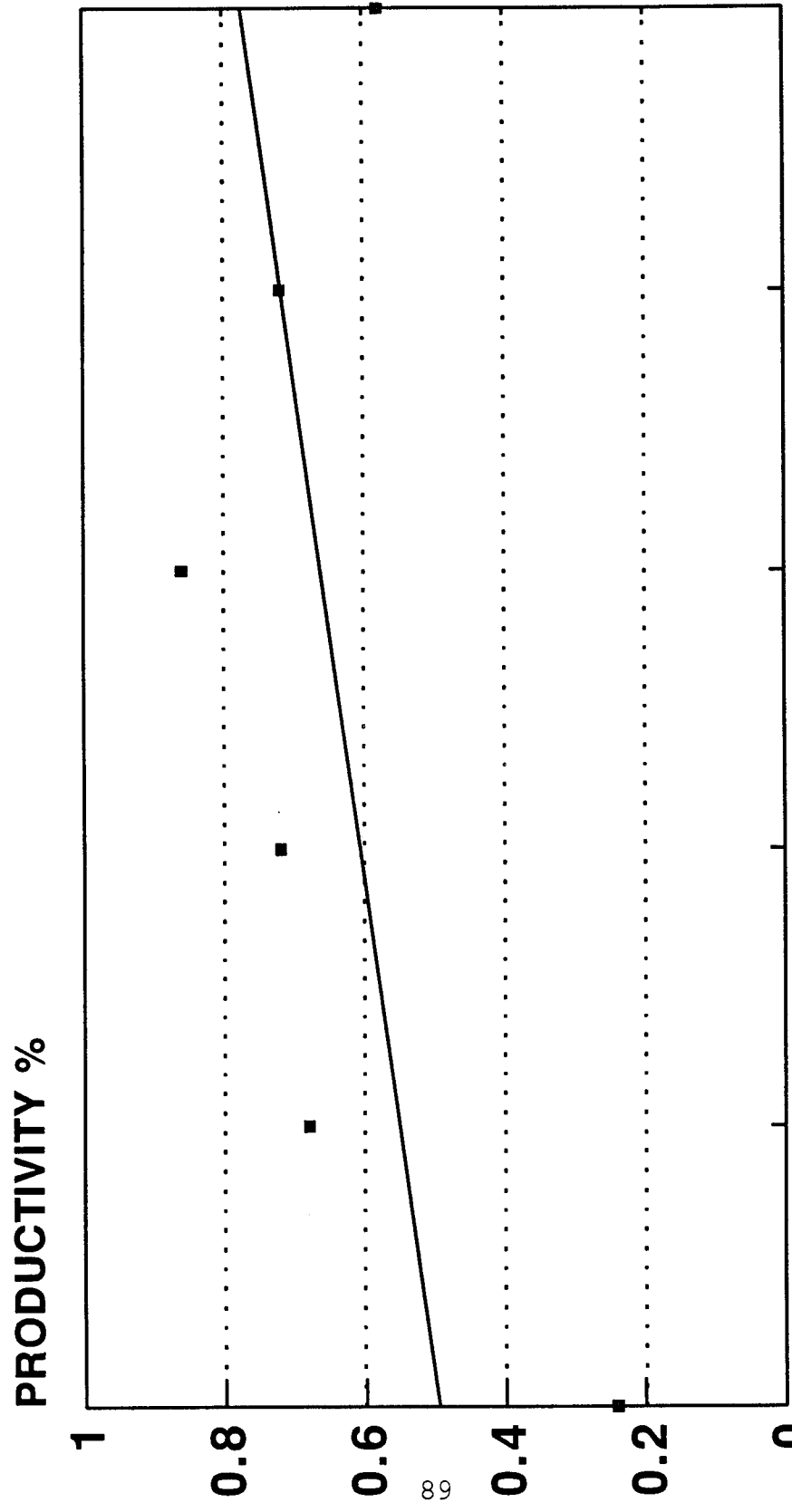
PRODUCTIVITY %

SEMI-ANNUAL PERIODS

*OCT91-MAR92 *APR92-SEP92 *OCT92-MAR93 APR93-SEP93 OCT93-MAR94 APR94-SEP94

-■- PRODUCTIVITY %

* PRE-APS PERIODS

89

NMC SAN DIEGO REQUISITIONS RECEIVED
PRE & POST APS

APPENDIX R

REQS (Thousands)

SEMI-ANNUAL PERIODS

→ #REQS

OCT91-MAR92 APR92-SEP92 *OCT92-MAR93 APR93-SEP93 OCT93-MAR94 APR94-SEP94

* APS INSTALLED JAN 93

91
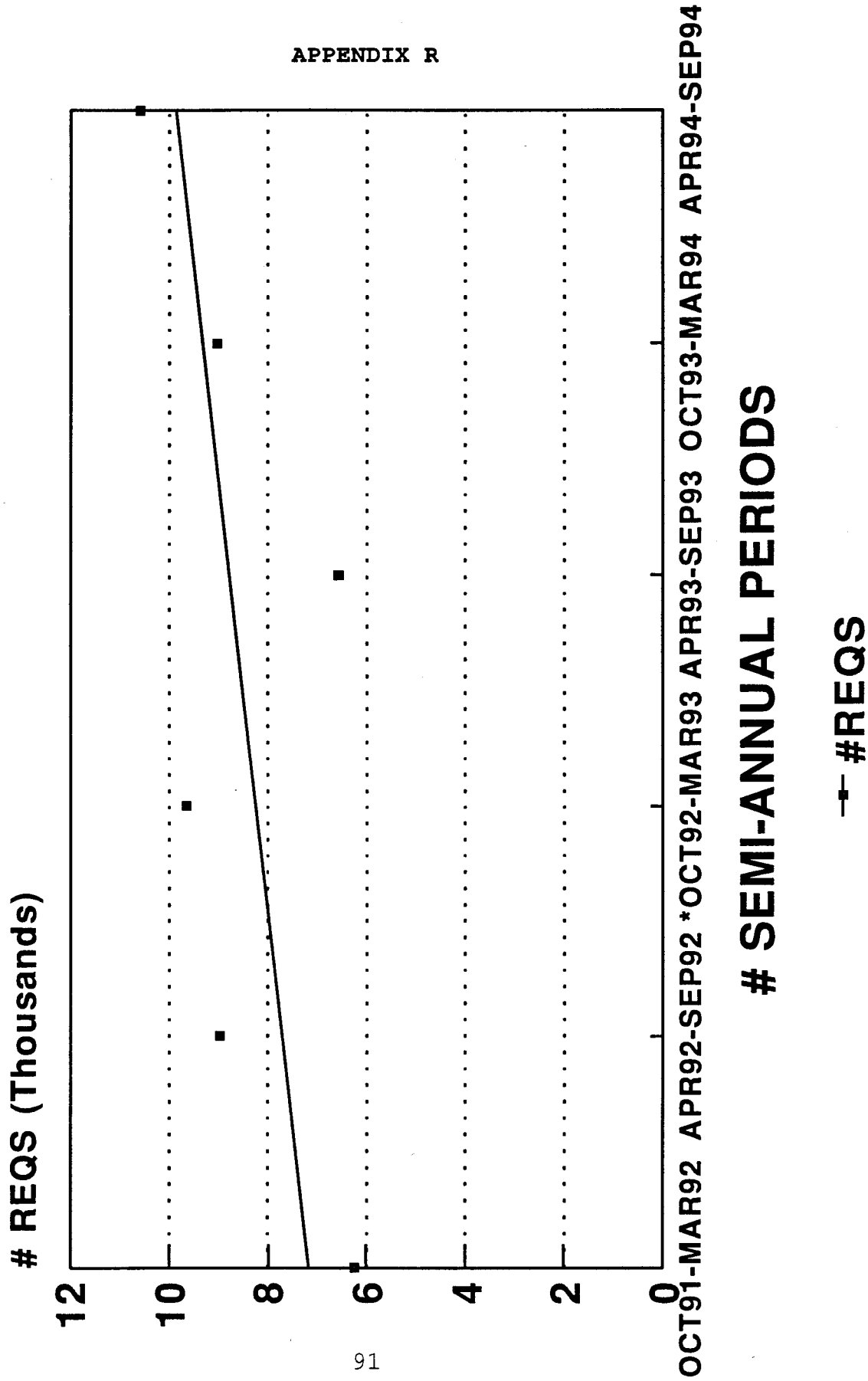
NMC SAN DIEGO DOCUMENTS AWARDED
PRE & POST APS

APPENDIX S

AWARDS (Thousands)

10 — 8 — 6 — 4 — 2 — 0

OCT91-MAR92 APR92-SEP92 *OCT92-MAR93 APR93-SEP93 OCT93-MAR94 APR94-SEP94

SEMI-ANNUAL PERIODS

-■- # AWARDS
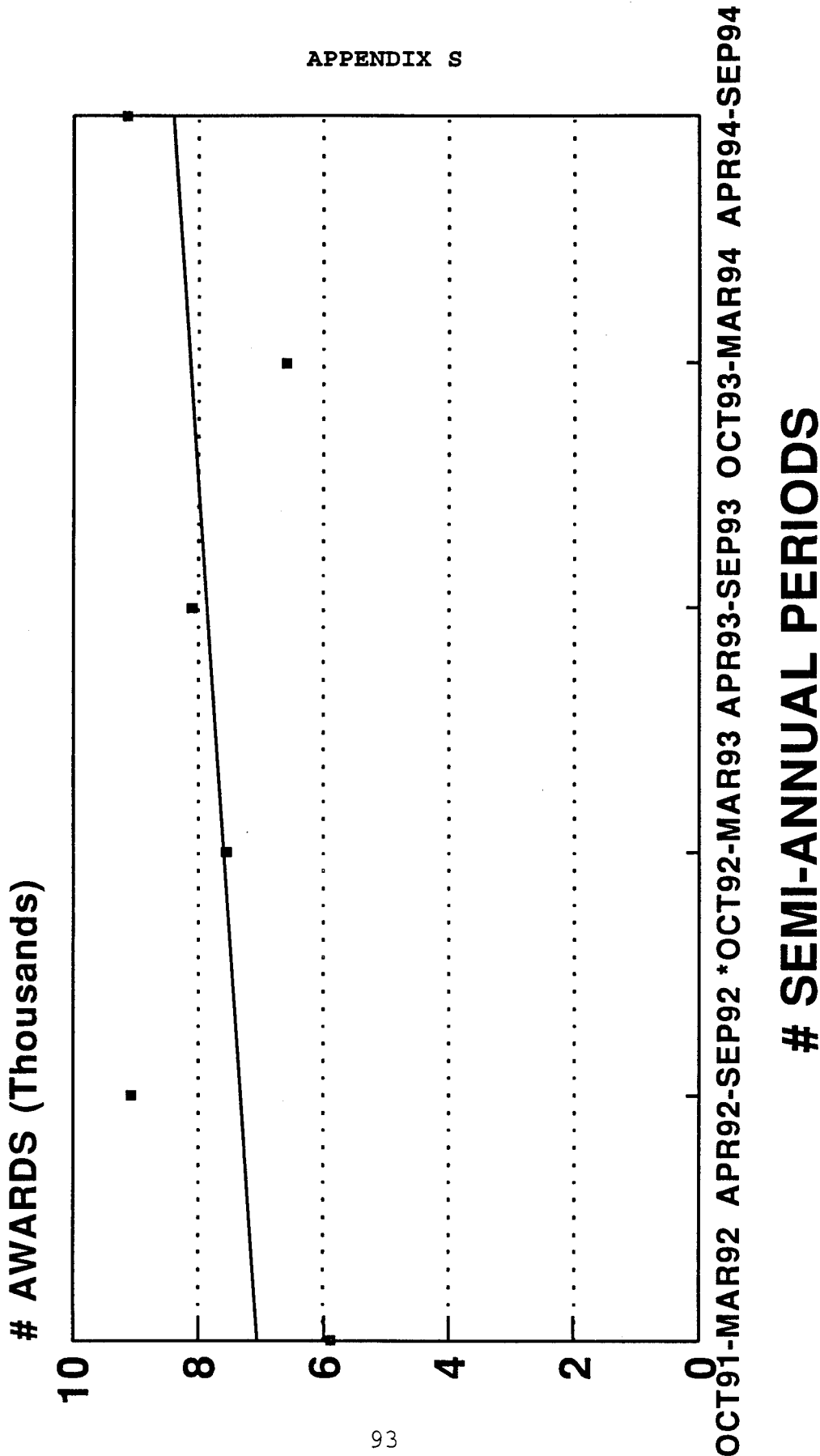
* APS INSTALLED JAN 93

93

NMC SAN DIEGO PALT
PRE & POST APS
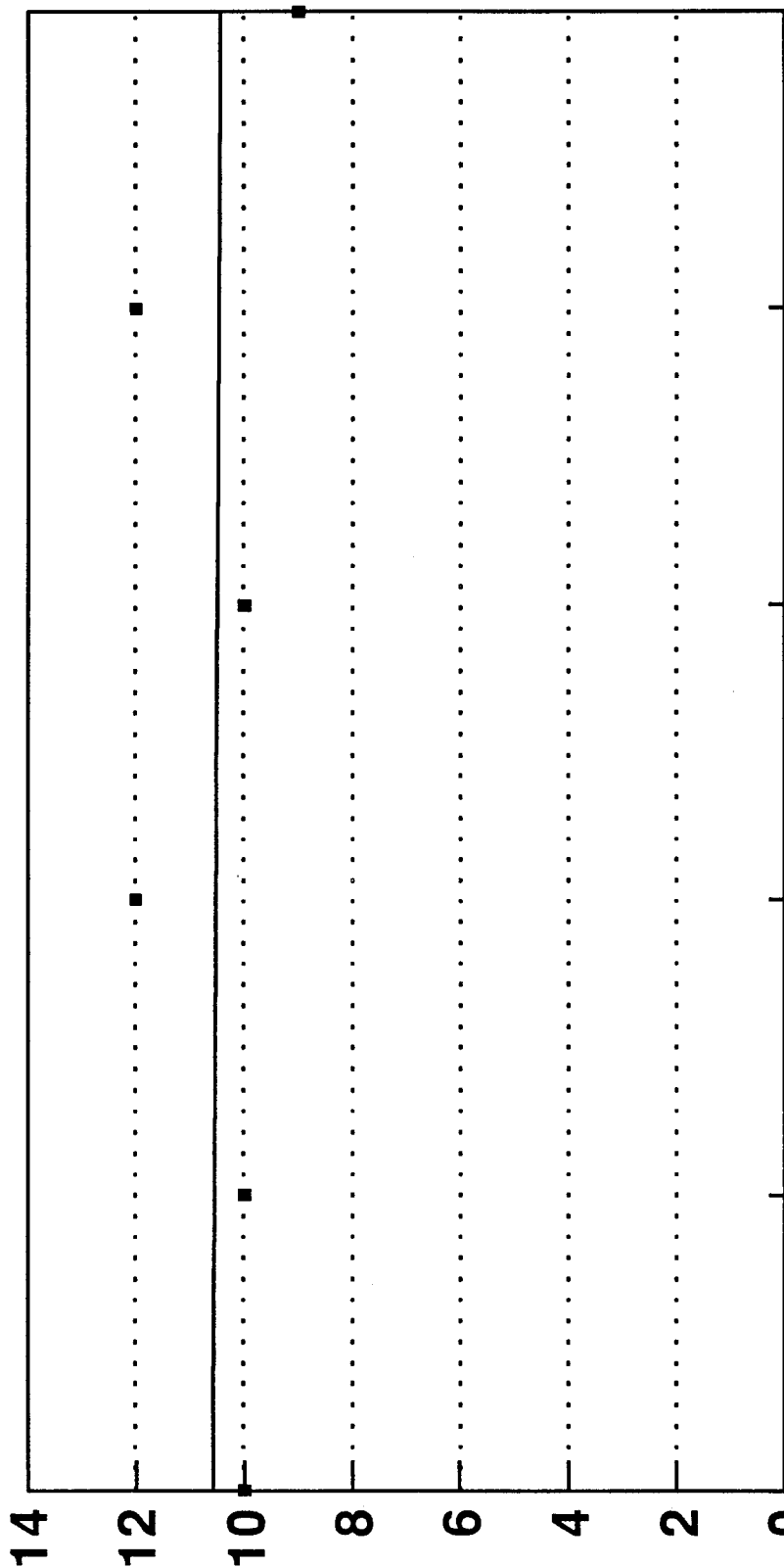
APPENDIX T

DAYS

14
12
10
8
6
4
2
0

OCT91-MAR92 APR92-SEP92 *OCT92-MAR93 APR93-SEP93 OCT93-MAR94 APR94-SEP94

SEMI-ANNUAL PERIODS

→ # DAYS

* APS INSTALLED JAN 93

95

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